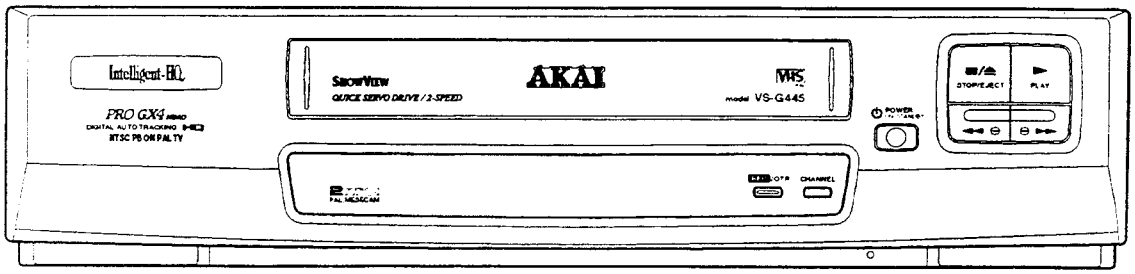
AKAI SERVICE MANUAL



HQ HIGH QUALITY VHS PAL SHOWVIEW

G-CODE VIDEOPlus+

MODEL VS-G445EOH

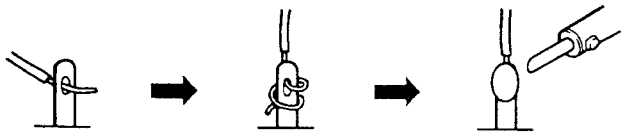
VIDEO CASSETTE RECORDER

MODEL VS-G445EA/EDG

★ SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

1. Parts identified by the ⚠ symbol are critical for safety. Replace them only with the parts number specified.
2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with the specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
3. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts.
   Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (insulating barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing micro switches
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap the ends of the wires securely around the terminals before soldering.



6. Make sure that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).
7. Check that replaced wires do not contact sharp edged or pointed parts.
8. Also check areas surrounding repaired locations.
9. Make sure that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

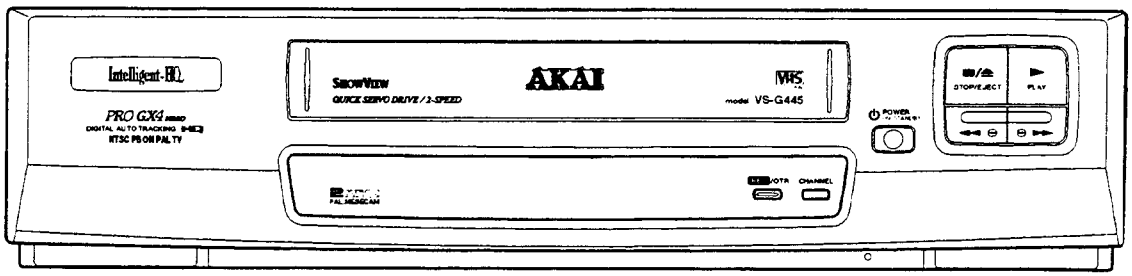
SAFETY CHECK AFTER SERVICING

After servicing, make measurements of leakage-current or resistance in order to determine that exposed parts are acceptably insulated from the supply circuit.
The leakage-current measurement should be done between accessible metal parts (such as chassis, ground terminal, microphone jacks, signal input/output connectors, etc.) and the earth ground through a resistor of 1500 ohms paralleled with a 0.15 µF capacitor, under the unit's normal working conditions.
The leakage-current should be less than 0.5 mA rms AC.
The resistance measurement should be done between accessible exposed metal parts and power cord plug prongs with the power switch (if included) "ON". The resistance should be more than 2.2 M ohms.

MAKE YOUR CONTRIBUTION TO PROTECT THE ENVIRONMENT

Used batteries with the ISO symbol for recycling as well as small accumulators (rechargeable batteries), mini-batteries (cells) and starter batteries should not be thrown into the garbage can.
Please leave them at an appropriate depot.

AKAI SERVICE MANUAL



MODEL VS-G445EOH

HQ HIGH QUALITY VHS PAL SHOWVIEW

G-CODE VIDEOPlus+

VIDEO CASSETTE RECORDER

MODEL VS-G240EA/EDG/EK/EM/EOH

MODEL VS-G241EOH

MODEL VS-G245EA/EDG/EK/EO/EOH

MODEL VS-G246EA/EK, G247EOG

MODEL VS-G250EM-K, G254EOH

MODEL VS-G255EOH, G257EOG

MODEL VS-G440EA/EDG

MODEL VS-G445EA/EDG/EK/EO/EOH

MODEL VS-G455EOH, G457EOG

★ SAFETY INSTRUCTIONS

PRECAUTIONS DURING SERVICING

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2. In addition to safety, other parts and assemblies are specified for conformance with such regulations as those applying to spurious radiation. These must also be replaced only with the specified replacements.
   Examples: RF converters, tuner units, antenna selector switches, RF cables, noise blocking capacitors, noise blocking filters, etc.
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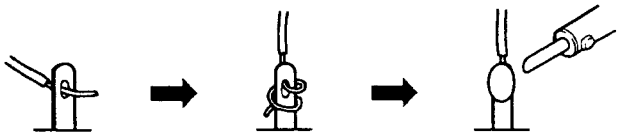
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads
4. Use specified insulating materials for hazardous live parts.
   Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers (insulating barriers)
   4) Insulation sheets for transistors
   5) Plastic screws for fixing micro switches
5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.), wrap the ends of the wires securely around the terminals before soldering.



6. Make sure that wires do not contact heat producing parts (heat sinks, oxide metal film resistors, fusible resistors, etc.).
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9. Make sure that foreign objects (screws, solder droplets, etc.) do not remain inside the set.

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After servicing, make measurements of leakage-current or resistance in order to determine that exposed parts are acceptably insulated from the supply circuit.
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Please leave them at an appropriate depot.

★ SPECIFICATIONS

Format
- EA/EK ..... VHS standard
- EDG/EM/EM-K/ EO/EOG/EOH ..... VHS standard (PAL/MESECAM)

Video recording system ..... Rotary, slant azimuth two-head helical scan system

Rotary heads
- VS-G240~G257 models .. 2 video heads
- VS-G440~G457 models .. 4 video heads

RF input
- EA ..... System B,G
  VHF: ch 0-5, 5A, 6-11, UHF: ch 21-69
- EDG ..... System D,K
  VHF: ch 1-12, UHF: ch 21-69
  System B,G
  VHF: ch 2-12, UHF: ch 21-69
  Cable: ch S1'-S3', S1-S41
- EK ..... System I
  UHF: ch 21-69
- EM ..... System B,G (PAL,SECAM)
  VHF: ch 2-12, UHF: ch 21-69
- EM-K ..... System D,K (OIRT ch)
  VHF: ch 2-12, UHF: ch 13-57
  System B,G (W.Europe ch)
  VHF: ch 2-12, UHF: ch 21-69
  System I (U.K. ch)
  UHF: ch 21-69
- EO ..... System B,G (PAL,SECAM)
  VHF: ch 2-4, 5-12, UHF: ch 21-69
  Cable: ch S1'-S3', S1-S20
- EOG/EOH ..... System B,G (PAL,SECAM)
  VHF: ch 2-4, 5-12, UHF: ch 21-69
  Cable: ch S1'-S3', S1-S41

RF output
- EA ..... System B type modulation
  VHF: ch 0,1 switchable (preset ch 1)
- EDG ..... System K/G type modulation
  UHF: ch 30-39 adjustable (preset ch 36)
- EK ..... System I type modulation
  UHF: ch 30-39 adjustable (preset ch 36)
- EM ..... System B type modulation
  VHF: ch 3,4 switchable (preset ch 4)
- EM-K ..... System G/K/I type modulation
  UHF: ch 30-39 adjustable (preset ch 36)
- EO/EOG/EOH ..... System G type modulation
  UHF: ch 30-39 adjustable (preset ch 36)

Recording (line input)
- EA/EK ..... PAL
- EDG/EM/EO/EOG/EOH .. PAL, SECAM (recorded as MESECAM)
- EM-K ..... PAL, SECAM (recorded as MESECAM)
  NTSC 3.58/4.43

Playback (line output)
- EA ..... PAL, NTSC 4.43 (NTSC tape)
  Simulated PAL (NTSC tape)
- EDG/EM/EM-K ..... PAL, SECAM (MESECAM tape)
  NTSC 4.43 (NTSC tape)
  Simulated PAL (NTSC tape)
- EK ..... PAL, Simulated PAL (NTSC tape)
- EO/EOG/EOH ..... PAL, SECAM (MESECAM tape)
  Simulated PAL (NTSC tape)

Video
- Line input level ..... 0.5-2.0 Vp-p/75 ohms, unbalanced
- Line output level ..... 1.0 Vp-p/75 ohms, unbalanced
- S/N ratio ..... More than 45 dB
- Horizontal resolution ..... More than 250 lines

Audio
- Line input level ..... –6 dBs/50 k ohms, unbalanced
- Line output level ..... –6 dBs/2 k ohms, unbalanced
- S/N ratio ..... More than 40 dB
- Frequency response ..... 70-8,000 Hz

Recording/Playback time

2 head models
(except VS-G240EM/G240EK/G245EK/G246EK/G250EM-K)
- CCIR ..... 240 min. with E-240 cassette
- NTSC (playback only) ..... 160 min. with T-160 cassette

2 head models (VS-G240EM/G240EK/G245EK/G246EK only)
- CCIR ..... 240 min. with E-240 cassette in SP mode
  480 min. with E-240 cassette in LP mode
- NTSC (playback only) ..... 160 min. with T-160 cassette in SP mode
  480 min. with T-160 cassette in EP mode

VS-G250EM-K
- CCIR ..... 240 min. with E-240 cassette in SP mode
  480 min. with E-240 cassette in LP mode
- NTSC ..... 160 min. with T-160 cassette in SP mode
  480 min. with T-160 cassette in EP mode

4 head models
- CCIR ..... 240 min. with E-240 cassette in SP mode
  480 min. with E-240 cassette in LP mode
- NTSC (playback only) ..... 160 min. with T-160 cassette in SP mode
  480 min. with T-160 cassette in EP mode

Tape speed

2 head models
(except VS-G240EM/G240EK/G245EK/G246EK/G250EM-K)
- CCIR ..... 23.39 mm/sec.
- NTSC ..... 33.35 mm/sec.

2 head models
(VS-G240EM/G240EK/G245EK/G246EK G250EM-K only)
- CCIR ..... 23.39 mm/sec. in SP mode
  11.695 mm/sec. in LP mode
- NTSC ..... 33.35 mm/sec. in SP mode
  11.12 mm/sec. in EP mode

4 head models
- CCIR ..... 23.39 mm/sec. in SP mode
  11.695 mm/sec. in LP mode
- NTSC ..... 33.35 mm/sec. in SP mode
  11.12 mm/sec. in EP mode

Quick finder ..... 5 times normal speed in all modes
FF, RWD time ..... Approx. 140 sec. with E-180 cassette
Timer
- Program ..... 4 programs/1 year and OTR
- Clock reference ..... Quartz crystal

Display ..... FLD (tape counter, timer etc.)
Power requirement
- EM/EM-K ..... 110-240 V AC, 50/60 Hz
- Except EM/EM-K ..... 220-240 V AC, 50 Hz

Power consumption ..... 16 W
Operating temperature ..... 5°C-40°C
Dimensions ..... 380 (W) x 90 (H) x 276 (D) mm
Weight ..... 4.0 kg

Standard accessories
- Antenna cable 1
- Remote control unit 1
- Batteries for remote control 2
- AC cord 1
- AC plug adaptor
  - CCT5902-0701 ..... 1 (G240EM(Y7)/G250EMK(Y7)/G440EDG only)
  - ECP-L01BK-R5 ..... 1 (G240EK/G245EK/G246EK/G250EM-K(Y6)/G445EK only)
- Operator's manual 1

0 dBs : 0.775 VRMS

* For improvement purposes, specifications and design are subject to change without notice.
* VIDEO PLUS AND PLUSCODE ARE TRADEMARKS OF GEMSTAR DEVELOPMENT CORP.
  VIDEO PLUS SYSTEM IS MANUFACTURED UNDER LICENCE FROM GEMSTAR DEVELOPMENT CORPORATION
* SHOWVIEW IS A TRADEMARK APPLIED FOR BY GEMSTAR DEVELOPMENT CORPORATION.
  SHOWVIEW SYSTEM IS MANUFACTURED UNDER LICENCE FROM GEMSTAR DEVELOPMENT CORPORATION.
* G-CODE IS A TRADEMARK APPLIED FOR BY GEMSTAR DEVELOPMENT CORPORATION.
  G-CODE SYSTEM IS MANUFACTURED UNDER LICENCE FROM GEMSTAR DEVELOPMENT CORPORATION.

★ INFORMATION

TRACKING/STABILITY ADJUSTMENT

To correct tracking during the normal playback, slow or still mode, only the remote control buttons can be used for the following adjustment.

- **To correct tracking during playback**
  If the tracking is not corrected satisfactorily by the automatic tracking function, press the remote control's "<" or ">" button until the picture is clear.

- **To correct tracking during the still mode**
  Press the remote control's "<" or ">" button repeatedly until the picture is clear.

- **To correct picture shake during the slow motion or still mode**
  Press the remote control's "∧" or "∨" button repeatedly until the picture shake is corrected.

ERROR ANNOUNCEMENT

When a malfunction occurs, the following error indicators appear on the FL display to indicate the problem when the power is turned off.

Err 1 : AL power supply has short circuited.

Err 2 : The loading motor has stopped.
(When the mechanism position detect switch is not able to read the specified code, that is to say not able to reach the specified position within the specified time.)

Err 3 : The drum motor has stopped.
(When the drum motor does not rotate due to condensation, etc.)

PRESETS IN THE TEST MODE

1) Engaging the "TEST MODE"

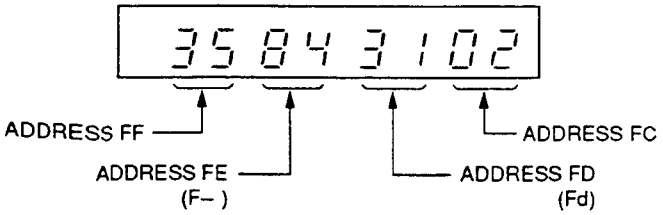
To set the VCR to the TEST MODE, press the "reset" button on the front panel first then plug in the AC power cord while pressing and holding both the "POWER" and "STOP/EJECT" buttons (on the front panel) at the same time.

Press the "reset" button to disengage the "TEST MODE". (The test mode is not disengaged, even if the AC cord is disconnected, without pressing the "reset" button.)

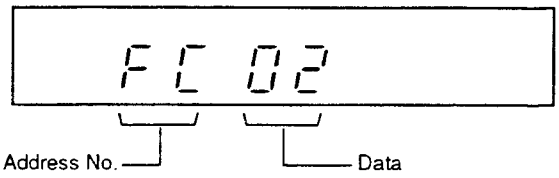
NOTE: Once the "reset" button has been pressed, clock and program data will be cancelled.

2) Model code preset

1. Engage the "test mode". The model code will be displayed in the FL display in 8 digit form.



2. While pressing both the "FF" and "RWD" buttons, press the "reset" button. (Never release the "FF", "RWD" buttons and "reset" button at the same time. Make sure to release the "reset" button first. Then keep holding the "FF" and "RWD" buttons until the address number "FC" appears.)
   The address number will be shown in 2 digits in the minutes display of the FL display and its data will be shown in 2 digits in the seconds display.



3. Select address "FC" by pressing the "FF" or "FWD" button if the address "FC" is not appeared.
4. Choose the data in the address FC column, that corresponds to the model number you are working on, from the following list. Set the chosen data value by pressing the "STOP" or "PLAY" button.

MODEL	MODEL CODE	ADDRESS			
		FC	Fd	F–	FF
VS-G240EA	16243802	02	38	24	16
VS-G240EDG	16803B02	02	3b	80	16
VS-G240EK	37563002	02	30	56	37
VS-G240EM	17043B02	02	3b	04	17
VS-G240EOH(E)	1684B102	02	b1	84	16
VS-G240EOH(Y1)	16843102	02	31	84	16
VS-G241EOH(Y1)	16843102	02	31	84	16
VS-G245EA	36243802	02	38	24	36
VS-G245EDG	3680BB02	02	bb	80	36
VS-G245EK	4F563002	02	30	56	4F
VS-G245EO	36043102	02	31	04	36
VS-G245EOH(Y1)	36843102	02	31	84	36
VS-G246EA	36243802	02	38	24	36
VS-G246EK	4F163002	02	30	16	4F
VS-G247EOG	3692B102	02	b1	92	36
VS-G250EM-K	17043F00	00	3F	04	17
VS-G254EOH(Y1)	4E96B102	02	b1	96	4–
VS-G255EOH(E)	4E84B102	02	b1	84	4–
VS-G255EOH(Y1)	4E96B102	02	b1	96	4–
VS-G257EOG	4E92B102	02	b1	92	4–
VS-G440EA	15243802	02	38	24	15
VS-G440EDG	15803B02	02	3b	80	15
VS-G445EA	35243802	02	38	24	35
VS-G445EDG	3580BB02	02	bb	80	35
VS-G445EK	4D563002	02	30	56	4d
VS-G445EO	35043102	02	31	04	35
VS-G445EOH(Y1)	35843102	02	31	84	35
VS-G455EOH(E)	4D84B102	02	b1	84	4d
VS-G455EOH(Y1)	4D96B102	02	b1	96	4d
VS-G457EOG	4D92B102	02	b1	92	4d

(On the FL display, B and D are indicated with small letters and E is indicated with –.)

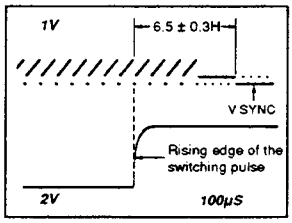
5. Memorize the data into the EEP ROM IC by pressing the "REC" button.

6. The address "Fd" and its data will be shown in the FL display approx 2 seconds later automatically. Repeat the presetting (steps 4 to 5) for addresses "Fd", "F–" and "FF" in the same manner as address "FC".
7. Press the "reset" button to disengage the model code preset mode.

NOTE : This model code preset is absolutely necessary when the IC404 (EEP-ROM) on the MAIN PCB is replaced.

3) Video switching point preset

1. Engage the "test mode".
2. Connect CH-1 of an oscilloscope to VIDEO OUT and CH-2 to the TP852 (V-SWP) on the PRE AMP PCB for triggering.
3. Play back the reference tape TF-530RFS (Part No.: AT-751775). Check the seconds display of the FL display so that "1F" (center position in the tracking range) is indicated at this point. If not indicated, press the "<" or ">" button on the remote control until "1F" is indicated.
4. Press the "REC" button during playback.
5. Confirm that the switching point is positioned 6.5±0.3 H before the left edge of the V-sync as shown.



NOTE :

a) Make sure that the A/C head phase adjustment has been adjusted correctly before making video switching point preset. (Refer to step 5-3-2)
b) This switching point preset is absolutely necessary after the following replacements.

- When the video head drum (upper drum) is replaced.
- When the DRUM MOTOR PCB or DRUM MOTOR's ROTARY MAGNET (ROTARY PLATE) is replaced.
- When the SERVO/SYSCON MI-COM or EEP ROM IC on the MAIN PCB is replaced.

4) Memorization of the reference RF envelope detect voltage (I-HQ)

For correct operation of the I-HQ tape tuning system, memorization of the reference RF envelope detect voltage is absolutely necessary. When the VIDEO HEAD DRUM, PRE AMP PCB or EEP ROM IC in the MAIN PCB is replaced for any reason, memorize the reference RF envelope detect voltage according to the following procedure.

1. Set the tape speed to "SP mode".
2. Make a recording on the I-HQ test tape "TF-556AT" (Part No. : AT-751822J) and rewind it to the exact point where the recording was started.
3. Set the VCR to the "test mode" then start playback.
4. Reference RF envelope detect voltage data in the memory is displayed in 2 digits in the hours display part of the FL display and the present envelope detect voltage data is displayed in 2 digits in the minutes display part (the data is displayed in hexadecimal numbers).
5. After the auto tracking has been activated, press the "CANCEL" button on the remote control. The present RF envelope detect voltage data will be transferred to the hour display 2 digits and memorized in the EEP ROM IC.
6. Cancel the "test mode" then set the tape speed to "LP mode" and repeat steps 2 to 5 for 2 speed models.

5) Other facilities in the test mode

1. Tracking position display

Tracking position data can be displayed on the FL display. Data is displayed in 64 steps in hexadecimal numbers from "00" to "3F" in the seconds display part on the FL display. Pressing the "TV/VCR" button on the remote control during playback directly sets the tracking to the maximum "3F" position and pressing the "COUNTER RESET" button sets it to the minimum "00" position.

Pressing the "PLAY" button during playback sets tracking to the center position "1F" automatically. If "1F" does not appear, even when the "PLAY" button is pressed, keep pressing the "<" or ">" button on the remote control until the "1F" appears and then press the "OK" button to memorize the position.

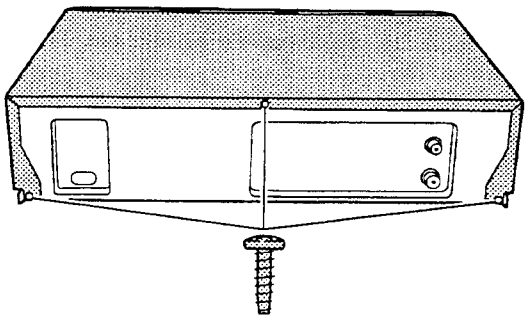
2. Suspension of the tape protection system

When the VCR is not in the "test mode", the "STILL" mode will be released after 5 minutes in order to protect the tape (the VIDEO HEAD DRUM stops rotating). However, the "STILL mode" will not be released during the "test mode".

I. DISASSEMBLY

In case of trouble, etc., necessitating dismantling, please dismantle in the order shown in the illustrations.
Reassemble in the reverse order.
When reattaching the FRONT PANEL, hold the cassette loading slot door in the upright (open) position.

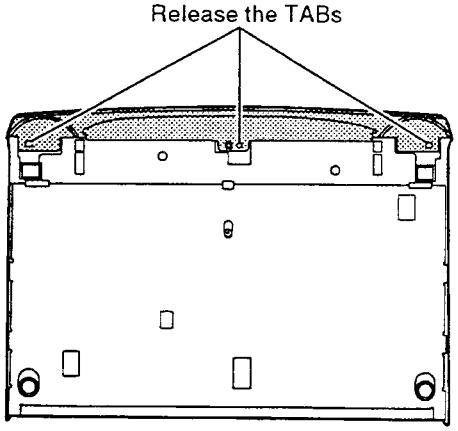
1. Removal of UPPER COVER



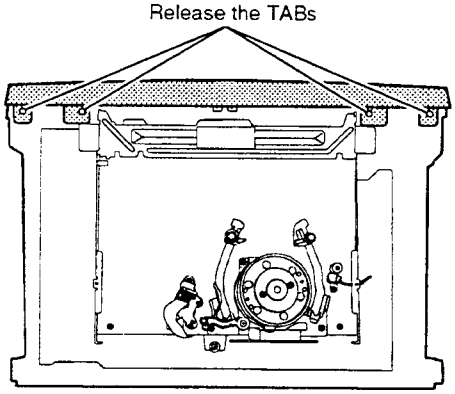
Slide the UPPER COVER backwards approx. 1 cm then lift the back part of the UPPER COVER up to remove.

2. Removal of FRONT PANEL

Release the TABs



Release the TABs



II. PRINCIPAL PARTS LOCATION

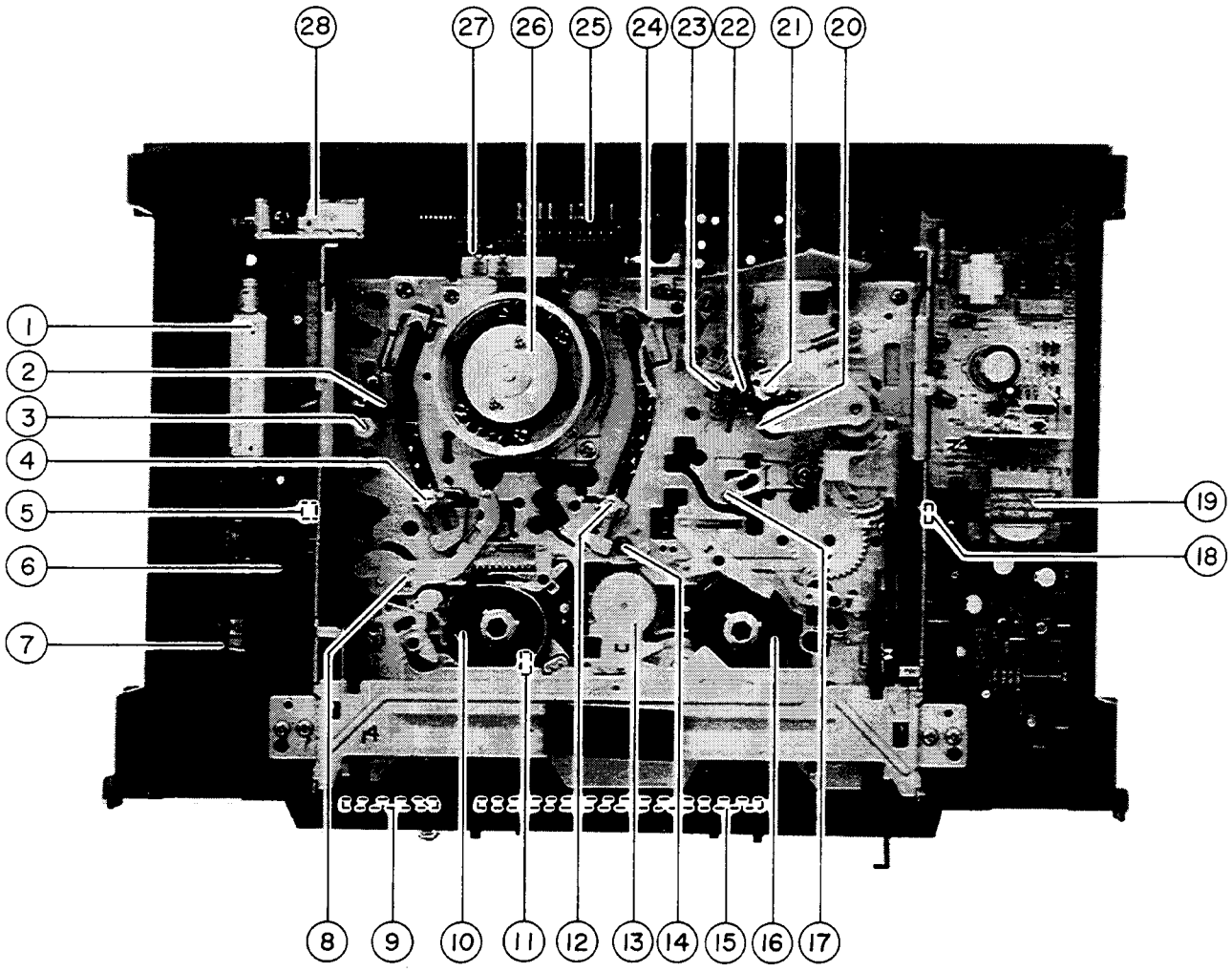


Fig. 2-1 Top view

1. TUNER UNIT
2. FULL TRACK ERASE HEAD
3. SUPPLY TAPE GUIDE
4. SUPPLY LOADING LEADER
5. END SENSOR
6. MAIN PCB
7. VIF PCB
8. TENSION ARM
9. DETECT PCB
10. SUPPLY REEL TABLE
11. REC SAFETY SWITCH
12. TAKE UP LOADING LEADER
13. IDLER ARM PART
14. SENSOR LED
15. FLD (FLUORESCENT DISPLAY)
16. TAKE UP REEL TABLE
17. REVIEW ARM
18. START SENSOR
19. PULSE POWER TRANSFORMER
20. PINCH ROLLER
21. CAPSTAN MOTOR BLOCK
22. TAKE UP TAPE GUIDE
23. A/C (AUDIO, CONTROL & SIDE TRACK ERASE) HEAD
24. HEAD CLEANER BLOCK
25. CANAL PLUS PCB (with DECODER models only)
26. VIDEO HEAD DRUM BLOCK
27. PRE AMP PCB
28. RF CONVERTER

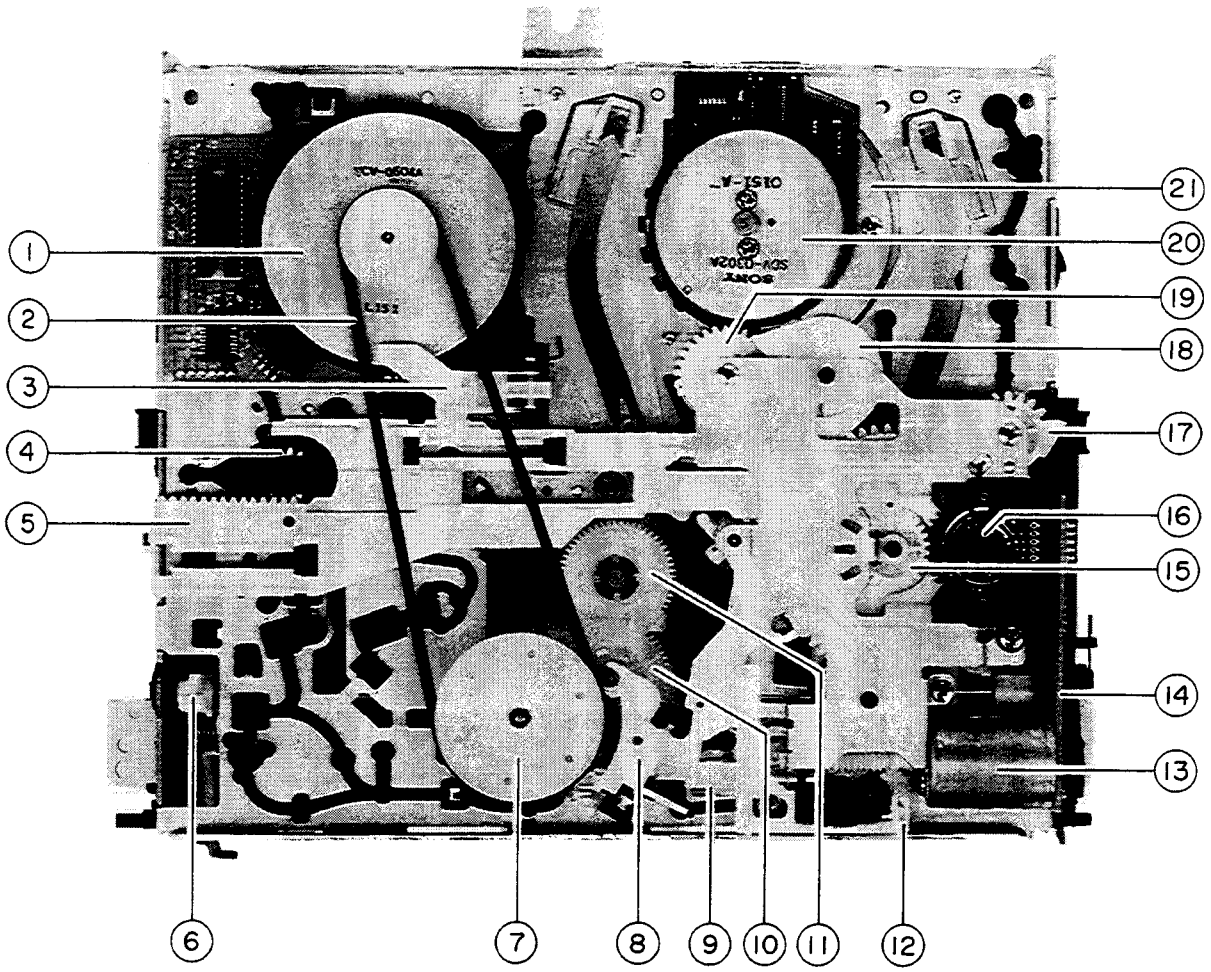


Fig. 2-2 Bottom view

1. CAPSTAN MOTOR BLOCK
2. CAPSTAN BELT
3. STILL BRAKE PART
4. PINCH GEAR
5. PINCH SLIDER
6. LOADING ARM BLOCK
7. CLUTCH DISK PART
8. COUPLING ARM
9. TRIGGER SLIDER
10. COUPLING GEAR BLOCK
11. IDLER ARM PART
12. REC.S LEVER
13. LOADING MOTOR
14. LM/MS PCB
15. CAM SLIDER GEAR
16. MODE DETECT SWITCH
17. FRONT LOADING GEAR
18. TOGGLE (S) GEAR BLOCK
19. TOGGLE (T) GEAR BLOCK
20. DRUM MOTOR BLOCK
21. DRUM CHASSIS

III. VIEWING THE OPERATION OF THE BOTTOM SIDE OF THE MECHANISM BLOCK

※ In case you want to check the operation of the bottom side of the mechanism block, proceed as follows.

3-1. REMOVAL OF THE FRONT PANEL BLOCK

1) Remove the FRONT PANEL BLOCK (refer to step 1-2, on page 6).

3-2. REMOVAL OF THE MECHANISM BLOCK

1) Disconnect the connector on the FULL TRACK ERASE HEAD.

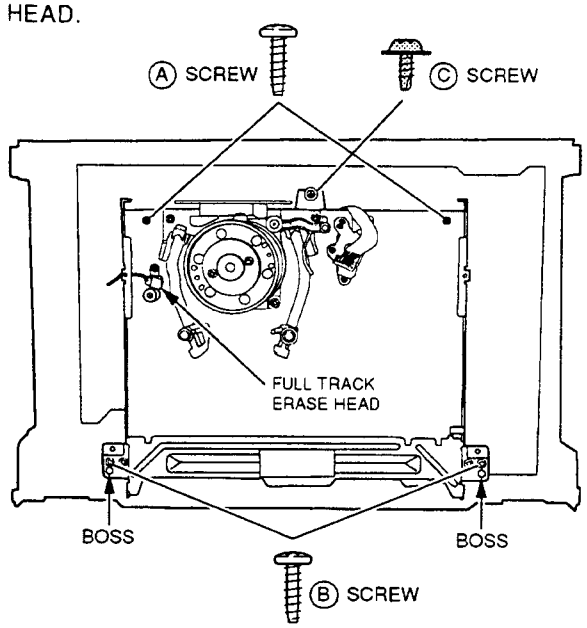


Fig. 3-1

2) Remove the two Ⓐ screws, two Ⓑ screws and the Ⓒ screw as shown in Fig. 3-1.
3) Remove the MECHANISM BLOCK and place an insulated sheet (or any suitable insulated material) on the MAIN PCB.
4) Place the MECHANISM BLOCK on the insulated sheet etc., standing it on end as shown in Fig. 3-2 taking care not to damage the flat cable on the PRE AMP PCB.

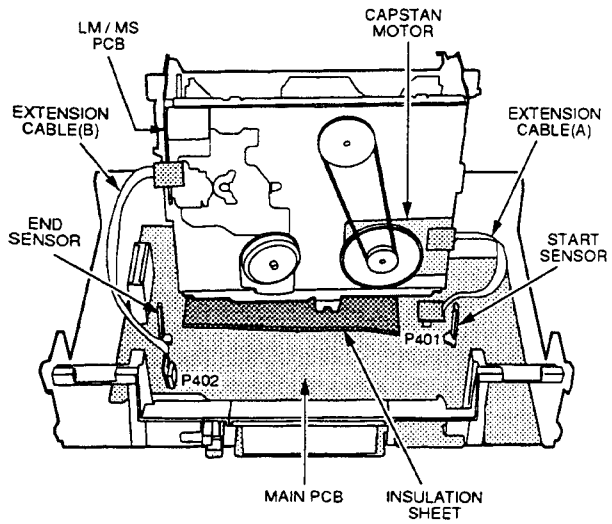


Fig. 3-2

3-3. CONNECTING THE EXTENSION CABLES

1) Connect the two extension cables (which were previously provided as the service jig) between the CAPSTAN MOTOR BLOCK and the P401 connector on the MAIN PCB, the LM/MS PCB and P402 connector on the MAIN PCB.

NOTE : The "front" mark on the extension cable (A)'s PCB must be facing front when connecting.

3-4. TURNING THE POWER ON

1) Place a cover (a ball point pen's cap etc.) on the start sensor, as shown in Fig. 3-2, in order to intercept the light to the sensor. The cover must be black or metal.
2) Engage the test mode (refer to information section, "PRESETS IN THE TEST MODE").
3) Remove the cover on the start sensor immediately after the cassette tape is inserted in the ejector. So the tape is drawn down automatically.
4) Cover both the start and end sensors at the same time with the covers just before the cassette tape reaches the lower position.
   Although the reel pulse is not generated, normal playback and CUE, REVIEW modes can be operated in this condition.
5) In case you want to change the tape, eject the present tape by pressing the "EJECT" button then remove the cover on the end sensor and repeat steps 3) to 4).

IV. DISASSEMBLY OF THE MAIN COMPONENTS

4-1. REMOVAL OF THE MECHANISM BLOCK

NOTE : Some parts in the mechanism block require complete removal of the mechanism block from the chassis when performing servicing.
Set the loading mechanism to the "EJECT" position by pressing the EJECT button. Then disconnect the AC power plug from the AC socket before proceeding. This sets the loading mechanism to the "reference position".

4-1-1. Removal of the PRE AMP PCB

1) Disconnect the flat cable from the P851 connector on the PRE AMP PCB.

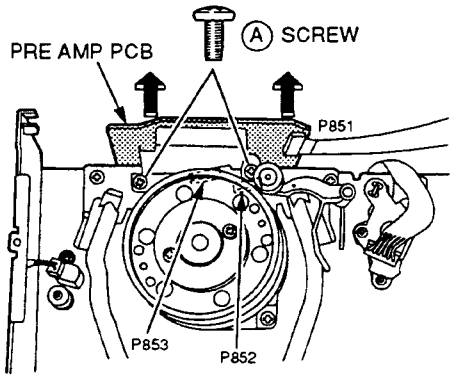


Fig. 4-1

2) Remove the two Ⓐ screws, then press both the left and right end of the PRE AMP PCB backward (in the direction of the arrow) as shown in Fig. 4-1.
3) Proceed in the reverse order for installation. Carefully align the connectors between the one on the LOWER DRUM, the one on the DRUM MOTOR PCB and P852 P853 on the PRE AMP PCB.

NOTE : Removal of the MECHANISM BLOCK is possible without removing the PRE AMP PCB.

4-1-2. Removal of the MECHANISM BLOCK.

1) Remove the FRONT PANEL BLOCK (refer to step 1-2 on page 6).
2) Disconnect the P851 connector on the PRE AMP PCB as shown in Fig. 4-1 if the PRE AMP PCB has not been removed.
3) Disconnect the connector on the FULL TRACK ERASE HEAD.
4) Disconnect the P1 connector on the A/C HEAD PCB.
5) Remove the two Ⓑ, Ⓒ screws and Ⓓ screw as shown in Fig. 4-2.
6) Pull up the MECHANISM BLOCK carefully to detach it from the chassis and the MAIN PCB.

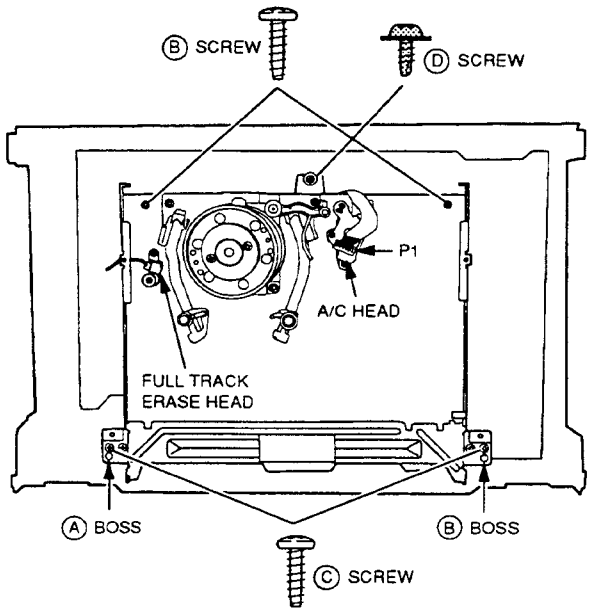


Fig. 4-2

4-1-3. Installation of the MECHANISM BLOCK

1) Carefully align the Ⓐ and Ⓑ bosses on the chassis with their corresponding holes on the MECHANISM BLOCK and tighten the five screws (refer to Fig. 4-2).
2) Proceed in the reverse order of 4-1-1 to 4-1-2, 4) for installation.

4-2. REMOVAL OF THE EJECTOR BLOCK

4-2-1. Removal of the CASSETTE LOAD BLOCK

1) Remove the two Ⓐ screws on the UPPER PLATE, as shown in Fig. 4-3 then remove the UPPER PLATE.

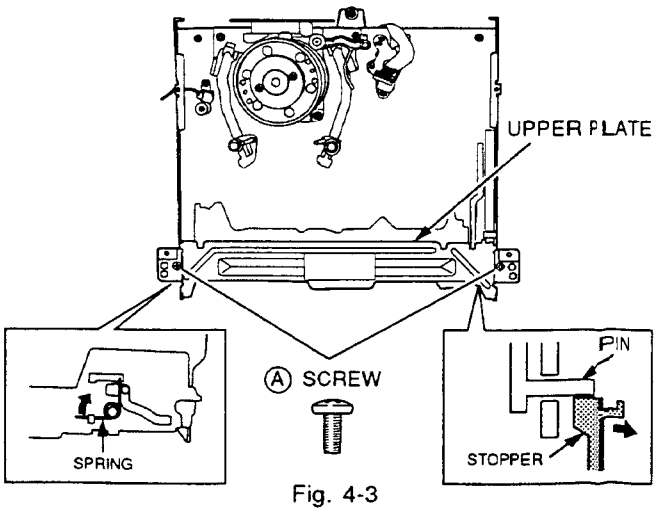


Fig. 4-3

2) Unhook the spring and remove it as shown in Fig. 4-3.
3) While pressing the right STOPPER in the direction of the arrow (refer to Fig. 4-3), gently remove the right side pin of the CASSETTE LOAD BLOCK from the rail by pulling it in the forward direction. Next, remove the left side pin in the same manner, then remove the CASSETTE LOAD BLOCK. To avoid damaging the pins of the CASSETTE LOAD BLK and the rail of the MECHA. FRAME, do not use excessive force when removing the CASSETTE LOAD BLK.

IV. DISASSEMBLY OF THE MAIN COMPONENTS

4-1. REMOVAL OF THE MECHANISM BLOCK

NOTE : Some parts in the mechanism block require complete removal of the mechanism block from the chassis when performing servicing.
Set the loading mechanism to the "EJECT" position by pressing the EJECT button. Then disconnect the AC power plug from the AC socket before proceeding. This sets the loading mechanism to the "reference position".

4-1-1. Removal of the PRE AMP PCB

1) Disconnect the flat cable from the P851 connector on the PRE AMP PCB.

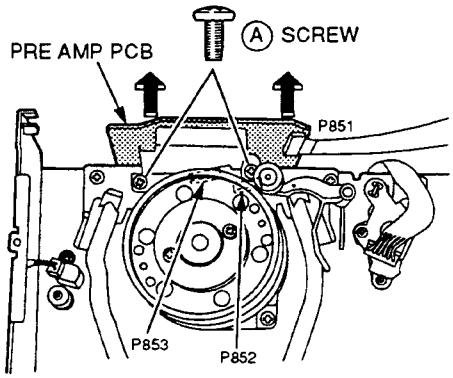


Fig. 4-1

2) Remove the two Ⓐ screws, then press both the left and right end of the PRE AMP PCB backward (in the direction of the arrow) as shown in Fig. 4-1.
3) Proceed in the reverse order for installation. Carefully align the connectors between the one on the LOWER DRUM, the one on the DRUM MOTOR PCB and P852 P853 on the PRE AMP PCB.

NOTE : Removal of the MECHANISM BLOCK is possible without removing the PRE AMP PCB.

4-1-2. Removal of the MECHANISM BLOCK.

1) Remove the FRONT PANEL BLOCK (refer to step 1-2 on page 6).
2) Disconnect the P851 connector on the PRE AMP PCB as shown in Fig. 4-1 if the PRE AMP PCB has not been removed.
3) Disconnect the connector on the FULL TRACK ERASE HEAD.
4) Disconnect the P1 connector on the A/C HEAD PCB.
5) Remove the two Ⓑ, Ⓒ screws and Ⓓ screw as shown in Fig. 4-2.
6) Pull up the MECHANISM BLOCK carefully to detach it from the chassis and the MAIN PCB.

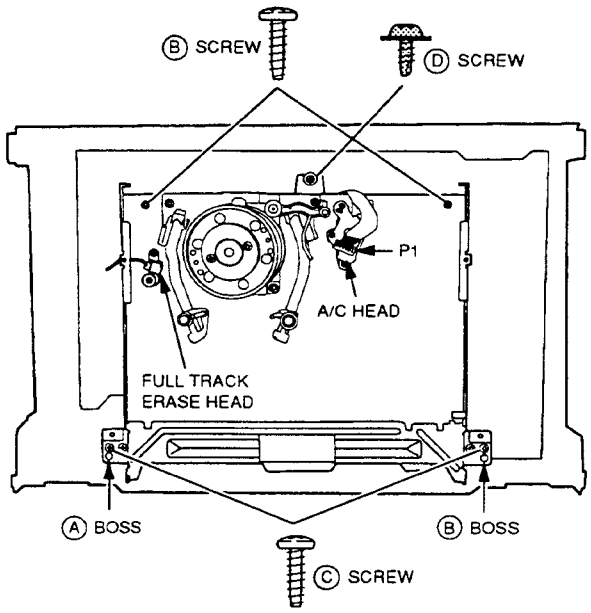


Fig. 4-2

4-1-3. Installation of the MECHANISM BLOCK

1) Carefully align the Ⓐ and Ⓑ bosses on the chassis with their corresponding holes on the MECHANISM BLOCK and tighten the five screws (refer to Fig. 4-2).
2) Proceed in the reverse order of 4-1-1 to 4-1-2, 4) for installation.

4-2. REMOVAL OF THE EJECTOR BLOCK

4-2-1. Removal of the CASSETTE LOAD BLOCK

1) Remove the two Ⓐ screws on the UPPER PLATE, as shown in Fig. 4-3 then remove the UPPER PLATE.

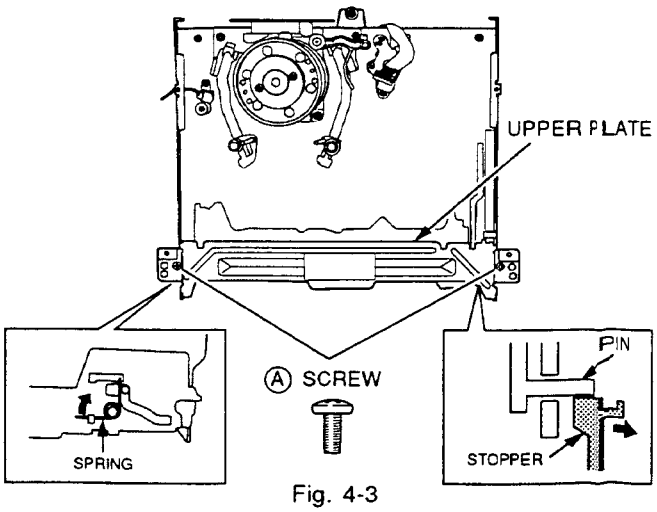


Fig. 4-3

2) Unhook the spring and remove it as shown in Fig. 4-3.
3) While pressing the right STOPPER in the direction of the arrow (refer to Fig. 4-3), gently remove the right side pin of the CASSETTE LOAD BLOCK from the rail by pulling it in the forward direction. Next, remove the left side pin in the same manner, then remove the CASSETTE LOAD BLOCK. To avoid damaging the pins of the CASSETTE LOAD BLK and the rail of the MECHA. FRAME, do not use excessive force when removing the CASSETTE LOAD BLK.

4-2-2. Removal of the LOADING ARM BLK

1) Release the stopper on the right side end of the LOADING ARM BLK's shaft (refer to Fig. 4-4) by pressing the stopper tab with a flat head (—) screwdriver. Then remove the shaft's right end from the bracket.

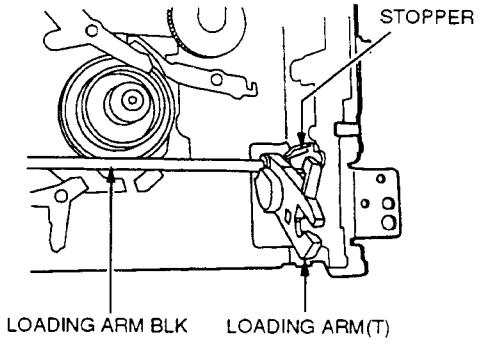


Fig. 4-4

2) Hold the LOADING ARM (T) and then pull out the shaft's left end from the bracket. Take special care when removing it to avoid damaging the pins (refer to Fig. 4-4).

4-2-3. Reassembling

1) Proceed in the reverse order of 4-2-1 to 4-2-2 for installation.

4-3. REMOVAL OF THE MODE DETECT SWITCH

Before proceeding with removal of the MODE DETECT SWITCH, the loading mechanism must be set to the "reference" position. If it has not already been set, use the following procedure to set the reference position.

※ Connect a 6 V battery to the loading motor until both the cam slider gear and mode detect switch reach the reference position (refer to Fig. 4-6).

4-3-1. Removal of the MODE DETECT SWITCH

1) Unsolder the 5 leads of the mode detect switch.

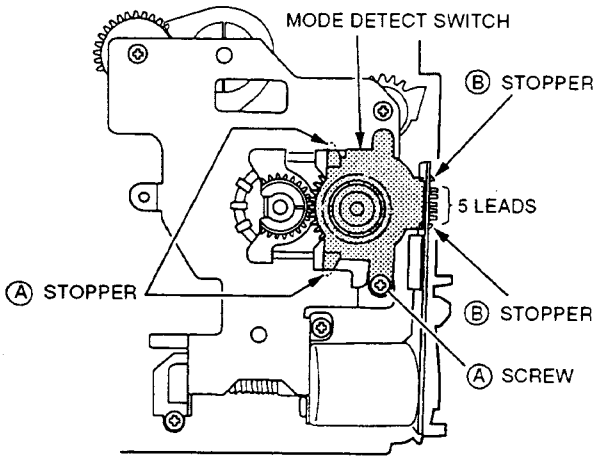


Fig. 4-5

2) Remove the Ⓐ screw.
3) While releasing the two Ⓐ stoppers and two Ⓑ stoppers, carefully remove the MODE DETECT SWITCH by pulling it up and to the left.

4-3-2. Installation of the MODE DETECT SWITCH

1) Install the mode detect switch in the reverse order of 4-3-1. When mounting the mode detect switch, align the mode detect switch's Ⓐ mark with the Ⓑ mark on the cam slider gear as shown in Fig. 4-6.

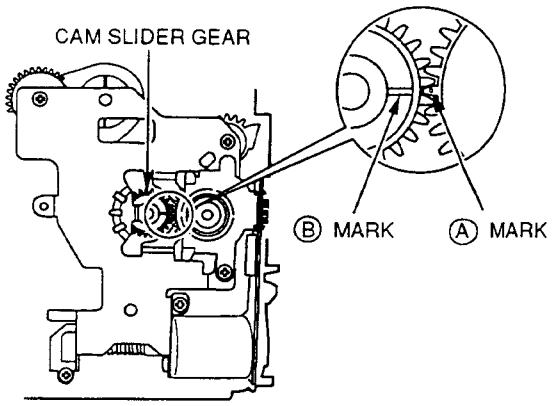


Fig. 4-6

4-4. DISASSEMBLY OF THE LOADING DRIVE BLOCK

※ Set the loading mechanism to the "reference" position. Refer to 4-3, "REMOVAL OF THE MODE DETECT SWITCH" before proceeding.

4-4-1. Removal of the LOADING DRIVE BLOCK

1) Remove the MODE DETECT SWITCH (refer to 4-3-1 "removal of the MODE DETECT SWITCH") if necessary.
2) Remove the Ⓐ, Ⓑ, Ⓒ and Ⓓ screws then remove the LOADING DRIVE BLOCK as shown in Fig. 4-7.

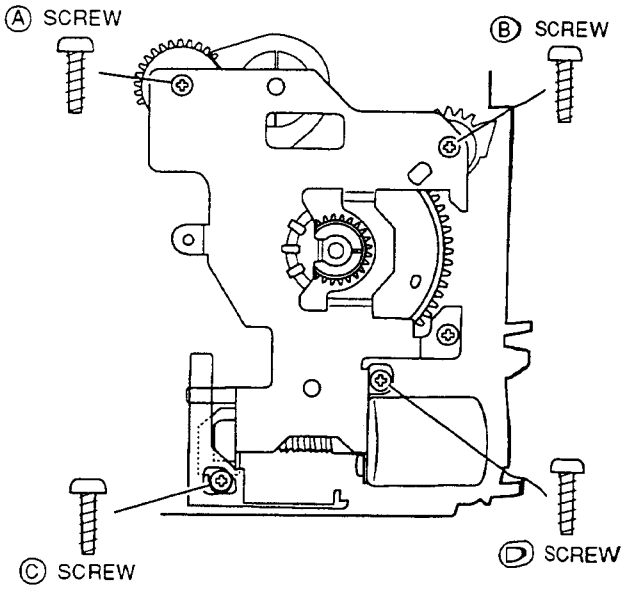


Fig. 4-7

4-2-2. Removal of the LOADING ARM BLK

1) Release the stopper on the right side end of the LOADING ARM BLK's shaft (refer to Fig. 4-4) by pressing the stopper tab with a flat head (—) screwdriver. Then remove the shaft's right end from the bracket.

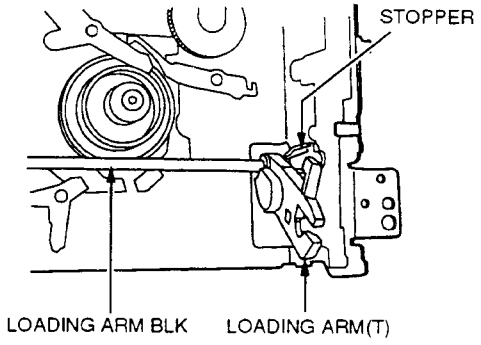


Fig. 4-4

2) Hold the LOADING ARM (T) and then pull out the shaft's left end from the bracket. Take special care when removing it to avoid damaging the pins (refer to Fig. 4-4).

4-2-3. Reassembling

1) Proceed in the reverse order of 4-2-1 to 4-2-2 for installation.

4-3. REMOVAL OF THE MODE DETECT SWITCH

Before proceeding with removal of the MODE DETECT SWITCH, the loading mechanism must be set to the "reference" position. If it has not already been set, use the following procedure to set the reference position.

※ Connect a 6 V battery to the loading motor until both the cam slider gear and mode detect switch reach the reference position (refer to Fig. 4-6).

4-3-1. Removal of the MODE DETECT SWITCH

1) Unsolder the 5 leads of the mode detect switch.

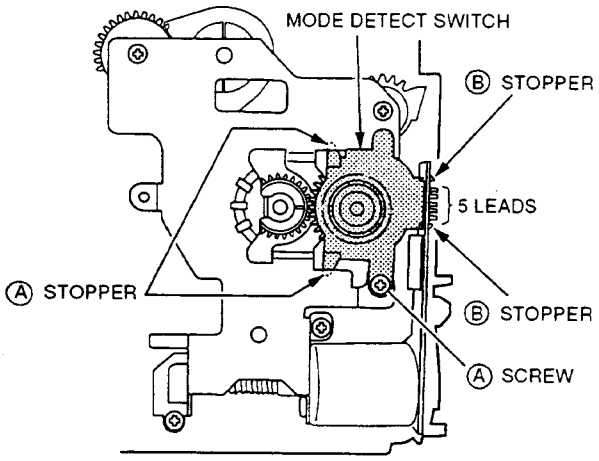


Fig. 4-5

2) Remove the Ⓐ screw.
3) While releasing the two Ⓐ stoppers and two Ⓑ stoppers, carefully remove the MODE DETECT SWITCH by pulling it up and to the left.

4-3-2. Installation of the MODE DETECT SWITCH

1) Install the mode detect switch in the reverse order of 4-3-1. When mounting the mode detect switch, align the mode detect switch's Ⓐ mark with the Ⓑ mark on the cam slider gear as shown in Fig. 4-6.

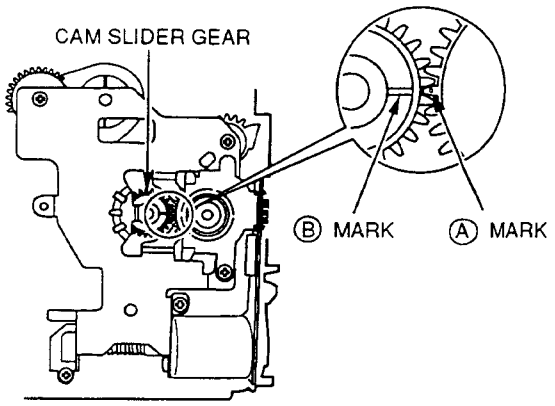


Fig. 4-6

4-4. DISASSEMBLY OF THE LOADING DRIVE BLOCK

※ Set the loading mechanism to the "reference" position. Refer to 4-3, "REMOVAL OF THE MODE DETECT SWITCH" before proceeding.

4-4-1. Removal of the LOADING DRIVE BLOCK

1) Remove the MODE DETECT SWITCH (refer to 4-3-1 "removal of the MODE DETECT SWITCH") if necessary.
2) Remove the Ⓐ, Ⓑ, Ⓒ and Ⓓ screws then remove the LOADING DRIVE BLOCK as shown in Fig. 4-7.

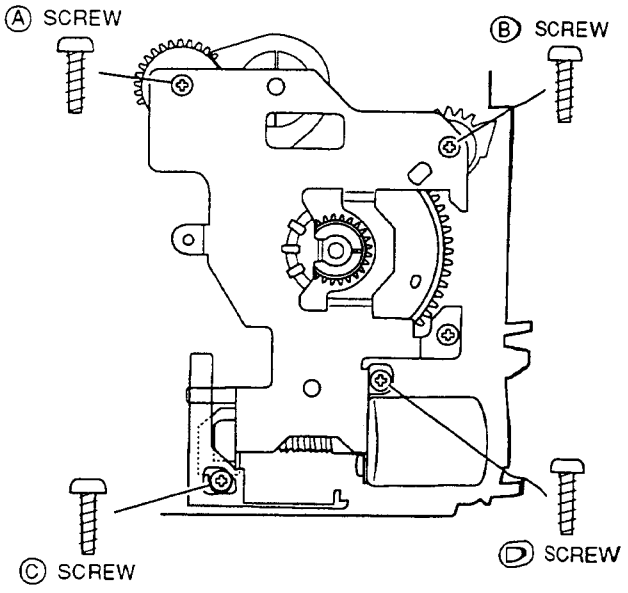


Fig. 4-7

4-4-2. Replacement of the LOADING MOTOR

1) Remove the LOADING DRIVE BLOCK (refer to 4-4-1)
2) Unsolder the two leads of the LOADING MOTOR.
3) Remove the two installation screws.

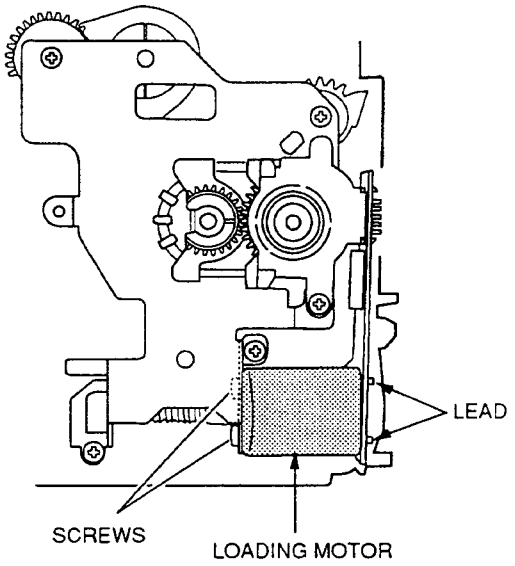


Fig. 4-8

4) Reassemble in the reverse order for installation.

4-5. REASSEMBLY OF THE LOADING MECHANISM BLK

4-5-1. Position of the TOGGLE GEARs (T) and (S)

1) Set the TOGGLE GEARs (T) and (S) to the unloaded position with your fingers. Align the Ⓐ mark on the TOGGLE GEAR (S) with the Ⓐ hole of the TOGGLE GEAR (T) as shown in Fig. 4-9.

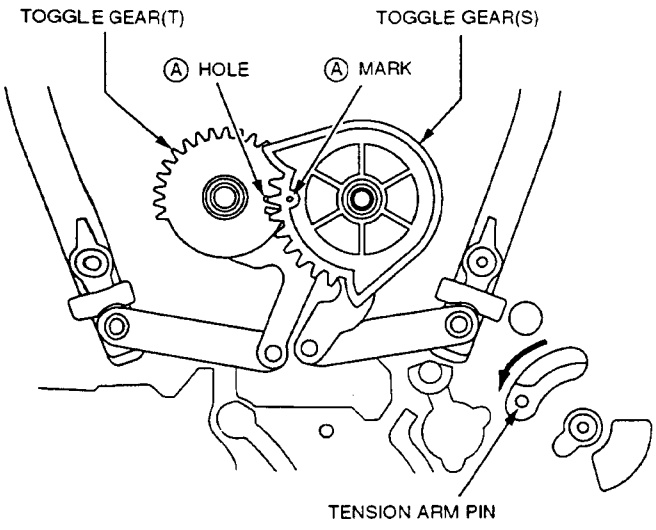


Fig. 4-9

NOTE : When positioning the TOGGLE GEAR (S), the TENSION ARM's pin should be moved in the direction of the arrow before placing the TOGGLE GEAR (S) onto its shaft.

4-5-2. Installation of the CAM SLIDER GEAR & FRONT LOADING GEAR

1) Attach the WORM WHEEL GEAR as shown in Fig. 4-10.

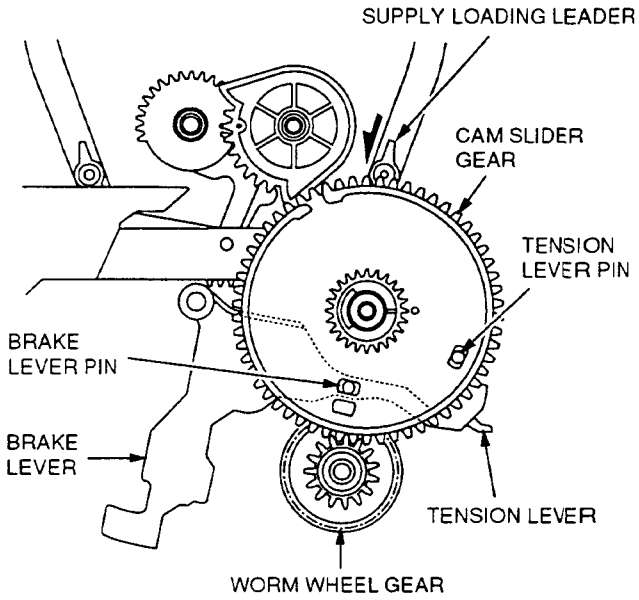


Fig. 4-10

2) Place the CAM SLIDER GEAR on the shaft and adjust the position of the BRAKE LEVER and TENSION LEVER so that both pins appear through the holes on the CAM SLIDER GEAR as shown in Fig. 4-10. When inserting the CAM SLIDER GEAR onto its shaft, press the SUPPLY LOADING GEAR slightly in the direction of the arrow to make installation easy.
3) Attach the FRONT LOADING GEAR so that the Ⓐ mark on the FRONT LOADING GEAR aligns with the Ⓑ mark on the FRONT LOADING SLIDER and that the Ⓒ mark on the FRONT LOADING GEAR aligns with the Ⓓ mark on the CAM SLIDER GEAR as shown in Fig. 4-11.

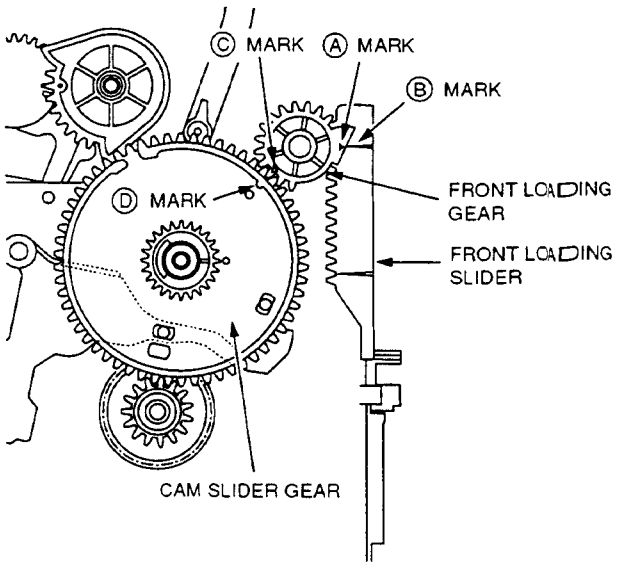


Fig. 4-11

4-5-3. Installation of the LOADING BLOCK & MODE DETECT SWITCH

1) Install the LOADING DRIVE BLOCK as shown in Fig. 4-12. Align the Ⓐ mark on the MODE DETECT SWITCH's gear with the Ⓑ mark on the CAM SLIDER GEAR when installing.

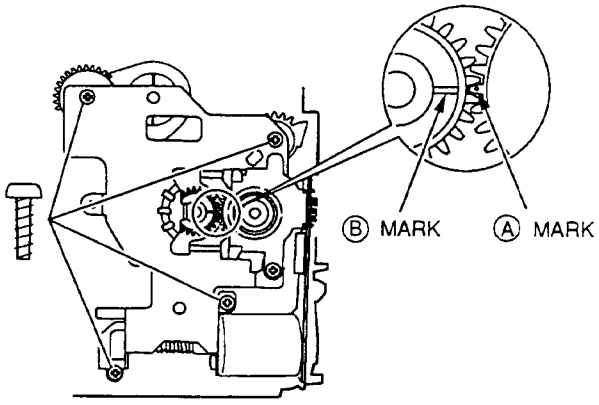


Fig. 4-12

4-6. REPLACEMENT OF THE PINCH ROLLER BLOCK

1) Remove the Ⓐ spring, then remove the PINCH ROLLER ARM BLOCK by turning it in the direction of the arrow and pulling it upward as shown in Fig. 4-13.

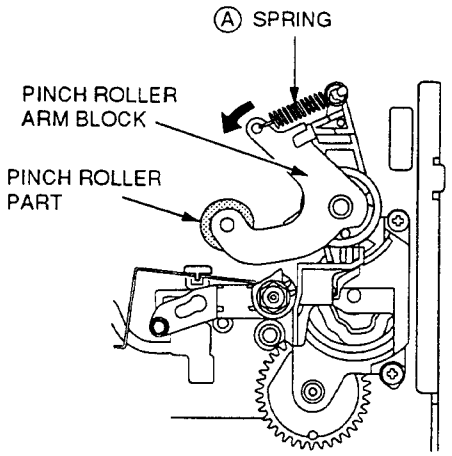


Fig. 4-13

2) Reassemble in the reverse order for installation.

4-7. DISASSEMBLY OF THE PINCH LEVER & PINCH HOLDER

4-7-1. Removal of the PINCH LEVER and PINCH HOLDER

1) Remove the two Ⓐ screws then remove the PINCH LEVER and PINCH HOLDER.

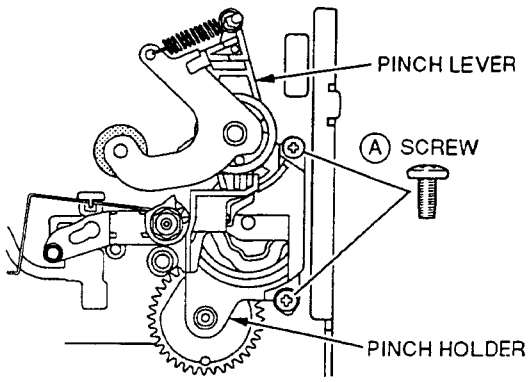


Fig. 4-14

4-7-2. Installation of the PINCH LEVER and PINCH HOLDER

1) Align the Ⓐ hole on the PINCH SLIDER with the Ⓐ mark on the PINCH GEAR through the hole on the chassis as shown in Fig. 4-15.

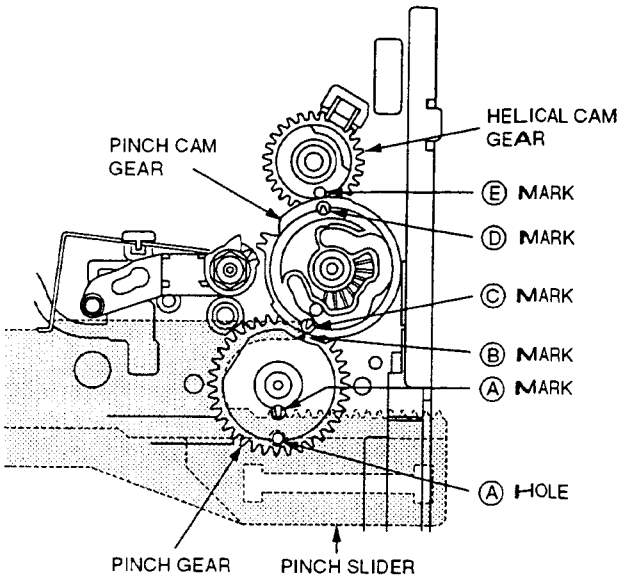


Fig. 4-15

2) Align the Ⓑ mark on the PINCH GEAR with the Ⓒ mark on the PINCH CAM GEAR and the Ⓓ mark on the PINCH CAM GEAR with the Ⓔ mark on the HELICAL CAM GEAR as shown in Fig. 4-15.
3) Install the PINCH LEVER and PINCH HOLDER in the reverse order.

4-8. DRUM MOTOR PC BOARD REPLACEMENT

1) Remove the two Ⓐ screws on the ROTARY PLATE and then remove it. (If the PRE AMP PCB is not removed yet, remove it first before removing the Ⓐ screws. Refer to 4-1-1, "Removal of the PRE AMP PCB.)

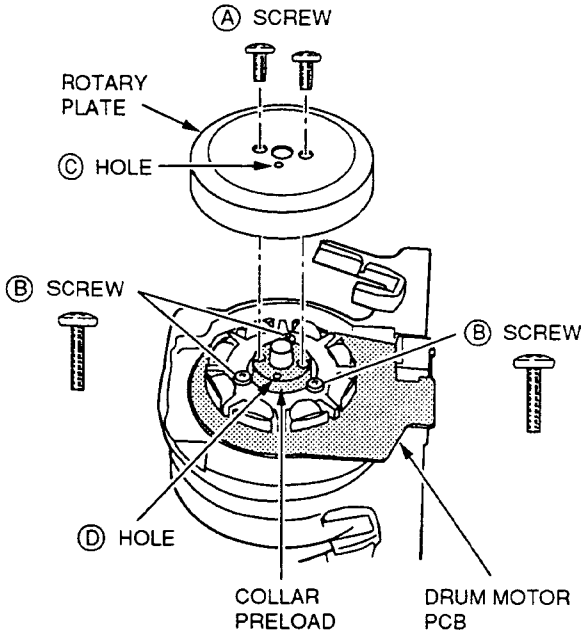


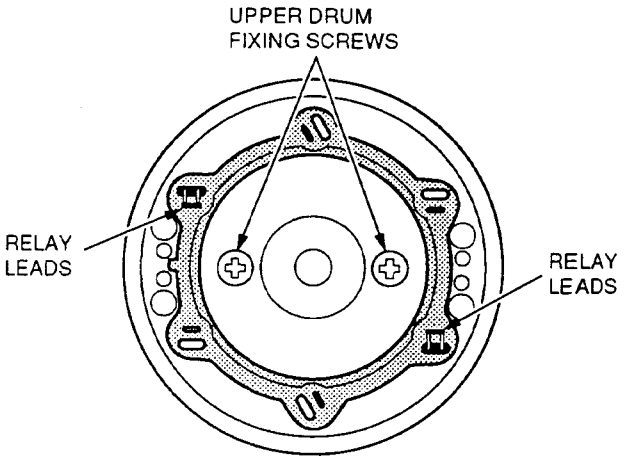
Fig. 4-16

2) Remove the three Ⓑ screws which retain the DRUM MOTOR PCB and replace it.
3) Attach the ROTARY PLATE to the collar preload so that the rotary plate Ⓒ hole and collar preload Ⓓ hole line up.
4) After replacement, PB switching point adjustment (INFORMATION, PRESET IN THE TEST MODE, #3) is absolutely necessary for the proper performance.

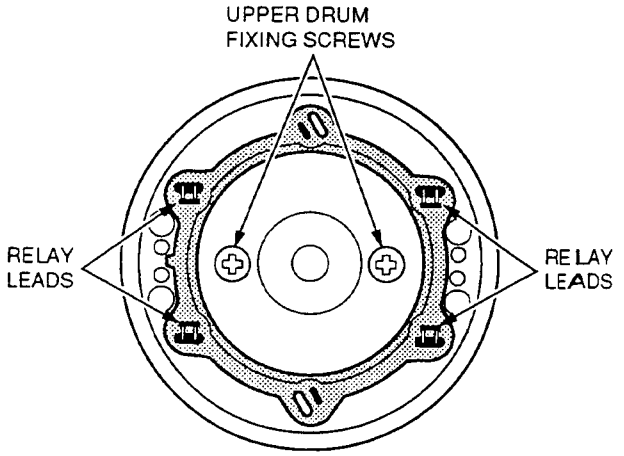
4-9. REPLACEMENT OF THE UPPER DRUM

4-9-1. Removal of the UPPER DRUM

1) Unsolder the relay leads and remove the two upper drum fixing screws as shown in Fig. 4-17.



[For 2 head models]



[For 4 head models]

Fig. 4-17

2) Gently lift and remove the UPPER DRUM.

4-9-2. Installation of the UPPER DRUM

[For 2 head models]

Attach the UPPER DRUM to the LOWER DRUM ROTOR so that the upper drum convex Ⓐ and lower drum rotor's white PCB line up as shown in Fig. 4-18.

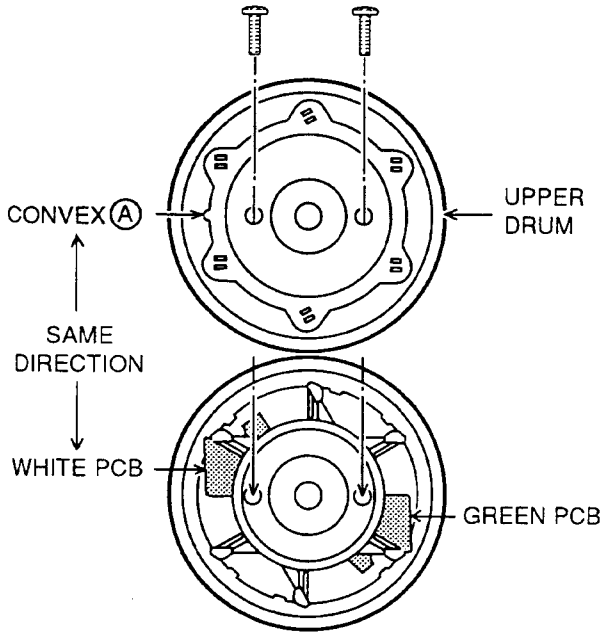


Fig. 4-18

[For 4 head models]

Attach the UPPER DRUM to the LOWER DRUM ROTOR, so that the upper drum convex Ⓐ and lower drum rotor's white mark line up, as shown in Fig. 4-19.

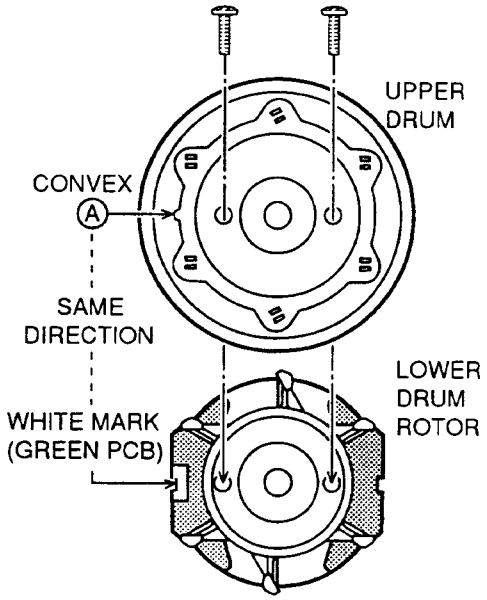


Fig. 4-19

NOTE : Because height precision is required for proper performance, and because head tips are fragile, the following points should be noted when replacing the UPPER DRUM BLOCK.

(a) Do not loosen the set screw on the collar preload.
(b) Before fixing, use alcohol to clean both surfaces where the upper drum and the rotary transformer meet.
(c) If the UPPER DRUM can not be inserted on to the shaft easily during installation, clean the hole in the UPPER DRUM with alcohol and put a little oil on the shaft.
(d) Make sure that the upper drum fixing screw holes, on the rotary transformer part, and the upper drum fixing screw penetration holes match exactly before inserting the fixing screws.
(e) Tighten the two upper drum fixing screws alternately and gradually.

4-9-3. After replacement

After replacement, the following adjustments are necessary for the proper performance.

1) Control head phase adjustment. (MECHANICAL ADJUSTMENT 5-3-2.)
2) PB switching point adjustment. (INFORMATION, PRESET IN TEST MODE #3)
3) ENV. DET (I-HQ) adjustment. (INFORMATION, PRESET IN THE TEST MODE #4)

V. MECHANICAL ADJUSTMENT

5-1. BACK TENSION ADJUSTMENT

1) Prepare a video cassette tape which you no longer need. Remove both tape reels and the tape protection cover from the cassette tape. Next, cover the video cassette's left and right detection holes with black adhesive tape.
2) Engage the playback mode using with a tapeless tape.
3) Confirm the distance between the three marks (lines) on the TENSION ARM and the Ⓐ mark on the MECHA. CHASSIS so that the Ⓐ mark aligns with the center line on the TENSION ARM as shown in Fig. 5-1.
4) If the result is not satisfactory, eject the tape and adjust the TENSION ADJUST repeatedly until a satisfactory result is achieved.

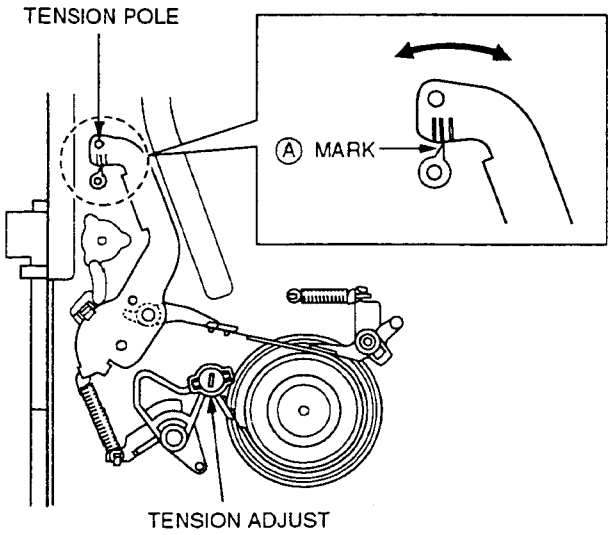


Fig. 5-1

5-2. TAPE TRANSPORT ADJUSTMENTS

In order to simplify the adjustment, two long square holes are made on the mechanism chassis. These holes should be used for their reflection image on the tape. If the shape of the reflection image on the tape is straight and not distorted, this means correct tape transport adjustment is achieved.

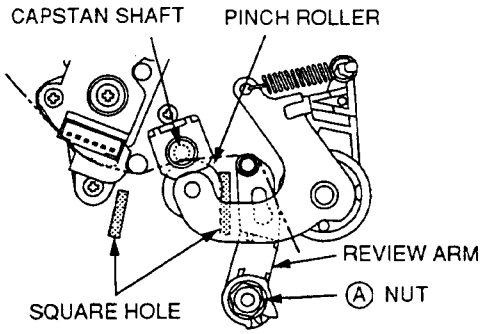


Fig. 5-2

NOTE : The following adjustments are required only when an irregularity is found, since these adjustments are precisely set at the factory.

5-2-1. Tape curl adjustment at the TAKE-UP TAPE GUIDE

1) Play back a recorded tape which is no longer needed.
2) Turn the Ⓐ screw on the A/C HEAD BLK, until the edge of the tape barely touches the lower part of the TAKE UP TAPE GUIDE, without any curl or wrinkle.

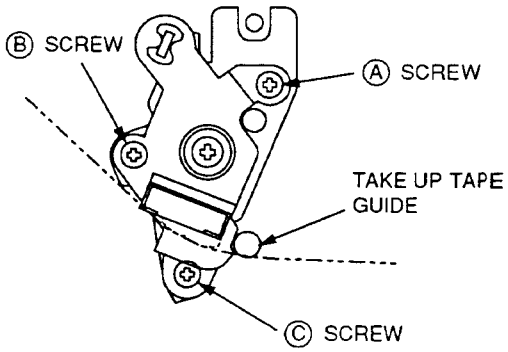


Fig. 5-3

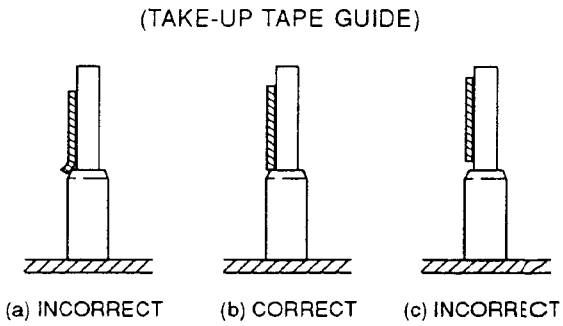


Fig. 5-4

3) Observe the reflection image of the square hole on the tape. If the shape is incorrect, proceed adjustment until satisfactory result is obtained.

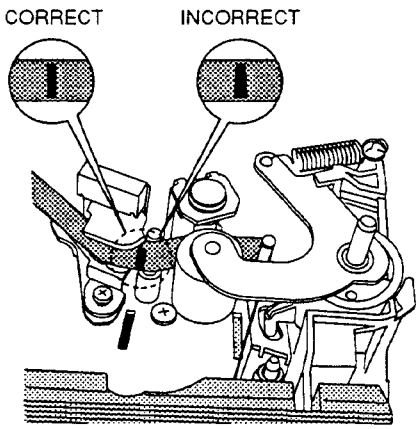
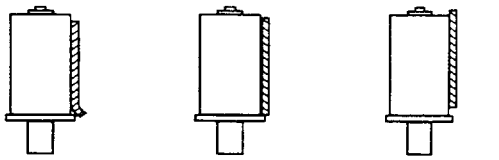


Fig. 5-5

4) Once the Ⓐ screw is adjusted, A/C HEAD height and azimuth adjustment is required. (Refer to 5-3 A/C HEAD POSITION ADJUSTMENT.)

5-2-2. Tape curl adjustment at the SUPPLY TAPE GUIDE

Confirm that the lower edge of the tape barely touches the lower part of the SUPPLY TAPE GUIDE, without any curl or wrinkle as shown in Fig. 5-6. If necessary, bend the neck part of the TENSION ARM in the Ⓐ or Ⓑ direction slightly until a satisfactory result is achieved.



(a) INCORRECT (b) CORRECT (c) INCORRECT

Fig. 5-6

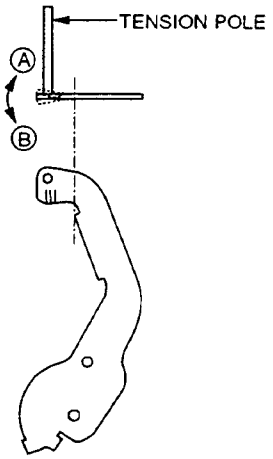


Fig. 5-7

5-2-3. REVIEW ARM height adjustment

1) Play back an E-180 (or TF-526HH test tape) tape.
2) Turn the REVIEW ARM height Ⓐ nut in the clockwise direction until the reflection image of the long square hole on the tape is distorted. (Refer to Fig. 5-2 and Fig. 5-8.)

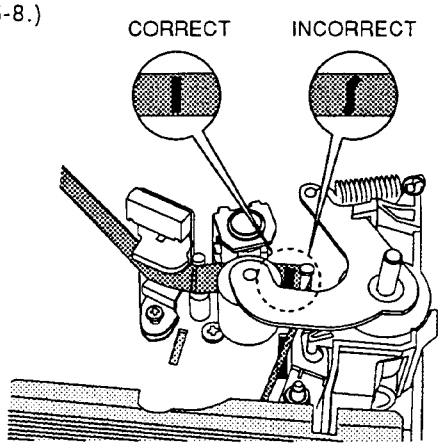


Fig. 5-8

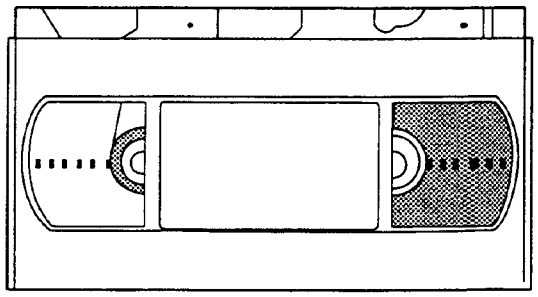
3) Turn the Ⓐ nut in the counter-clockwise direction little by little until the reflection image on the tape is satisfactorily shaped. Confirm that the edge of the tape barely touches the lower part of the TAKE-UP TAPE GUIDE without any curl or wrinkle among the TAKE-UP TAPE GUIDE, CAPSTAN SHAFT and REVIEW ARM.

5-2-4. A/C HEAD height adjustment

1) Play back test tape TF-526HH (Part No. : AT-751788).
2) Connect an oscilloscope to the AUDIO OUT terminal on the rear panel .
3) Slightly turn the © screw so that the output level is between 30 ~ 80 mVp-p. (refer to Fig. 5-3.)
4) Slightly turn the Ⓐ screw until the tape edge barely touches the lower part of the TAKE-UP TAPE GUIDE without any curl or wrinkle as shown in Fig. 5-4.
5) Confirm whether the output level is still between 30 ~ 80 mVp-p or not. If the result is not satisfactory, repeat steps 3) to 5).
6) Check the reflection image on the tape again. If the shape of the image is not satisfactorily, repeat the adjustment from 5-2-3 to 5-2-4 until satisfactory result is obtained.

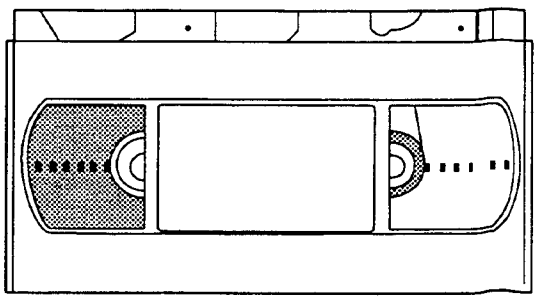
5-2-5. CUE/REVIEW check

1) Play back the last part of an E-240 tape and set the unit to the REVIEW mode by pressing the REW button. (Remove the tape protection cover to make the adjustment easier.)



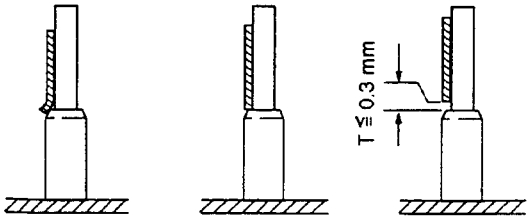
(REVIEW mode)
Fig. 5-9

2) Confirm there is no curl or wrinkle among the TAKE-UP TAPE GUIDE, CAPSTAN SHAFT and REVIEW ARM. Also, the reflection image of the long square hole on the tape should be satisfactorily shaped.
If the result is not satisfactory, repeat the adjustment from 5-2-3 to 5-2-4.
3) Play back the beginning part of an E-240 tape and this time set the unit to the CUE mode by pressing the F. FWD button.



(CUE mode)
Fig. 5-10

4) Confirm there is no curl or wrinkle near the REVIEW ARM's guide. If curl or wrinkle of the tape occurs, slightly turn the Ⓐ nut (Shown in Fig. 5-2) until it disappears.
5) Set the unit to the REVIEW mode again. Then confirm that there is no curl or wrinkle near the TAKE-UP TAPE GUIDE. (A small gap may appear after this adjustment, but this is allowable.)



(a) INCORRECT (b) CORRECT (c) CORRECT

Fig. 5-11

NOTE :

1. If the results are not satisfactory, repeat steps 2) to 5).
2. Always play an undamaged tape to obtain satisfactory adjustment.
3. Because an E-240 tape can be damaged easily, due of its thinness, a pre-adjustment with an E-180 tape is recommended.

5-2-6. LOADING LEADER height adjustments

1) Slightly loosen the set screw at the lower part of the LOADING LEADERs (L), (R) so that the LOADING LEADER can be adjusted with reasonable tightness. (Refer to Fig. 5-12.)

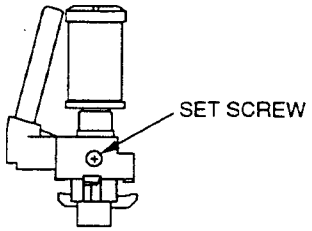


Fig. 5-12

2) Play back the reference tape TF-530RFS (Part No. : AT-751775).
3) Connect an oscilloscope's CH-1 to the TP851 (ENVE) on the PRE AMP PCB and CH-2 to the TP852 (V-SWP) for triggering.
4) Turn the LOADING LEADER heads with a flat head(–) screw driver to obtain a flat RF envelope as the ideal envelope, as shown in Fig. 5-13.
5) After adjustment is completed, tighten the loading leader set screws.

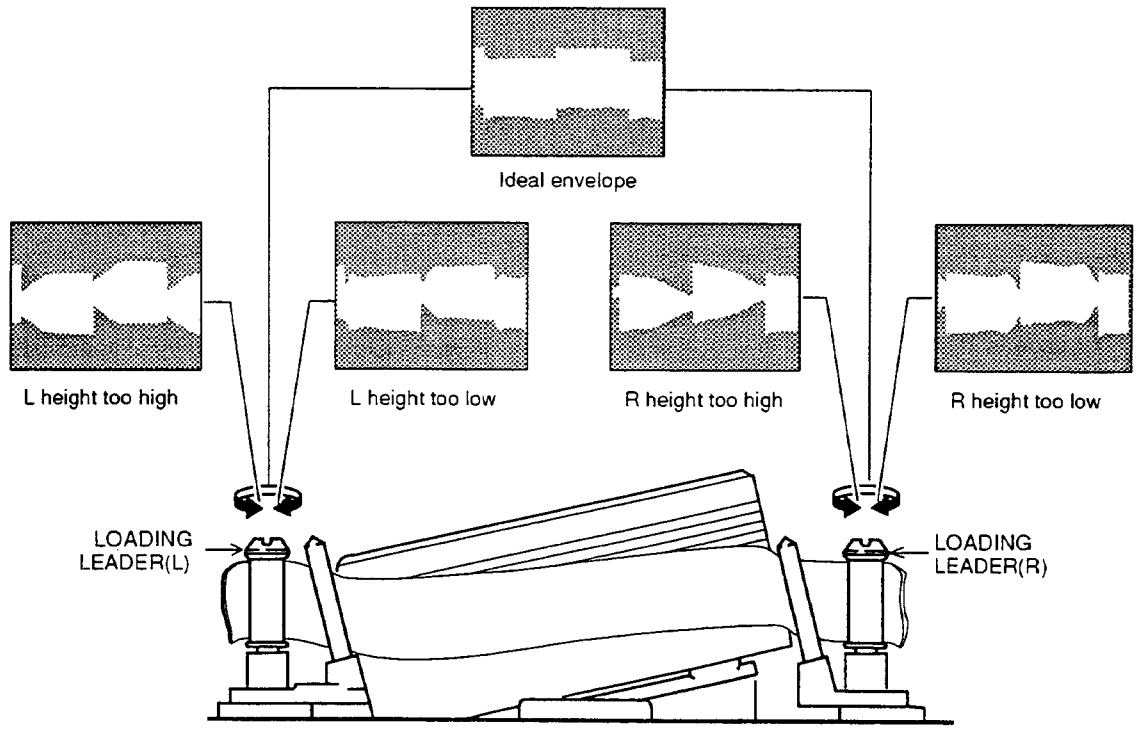


Fig. 5-13

5-3. A/C HEAD POSITION ADJUSTMENT

※ Refer to Fig. 5-3 for the adjustment points.

5-3-1. Azimuth adjustment

1) Connect an AC voltmeter or an oscilloscope to the AUDIO OUT terminal on the rear panel.
2) Play back the reference tape TF-530RFS (Part No. : AT-751775).
3) Adjust the Ⓑ screw to obtain the maximum audio output.

5-3-2. Tracking adjustment

1) Engage the "TEST MODE" (refer to "INFORMATION", PRESET IN THE TEST MODE #1).
2) Connect CH-1 of an oscilloscope to the TP851 (ENVE) on the PRE AMP PCB and CH-2 to the TP852 (SWP) for triggering.
3) Play back the reference tape TF-530RFS (Part No.: AT-751775). Check the seconds display of the FL display so that "1F" (centre position in the tracking range) is indicated at this point. If not displayed, press the "<" or ">" button on the remote control until "1F" is indicated.
4) Loosen the Ⓒ screw slightly so that the A/C HEAD BASE can be moved with reasonable tightness.

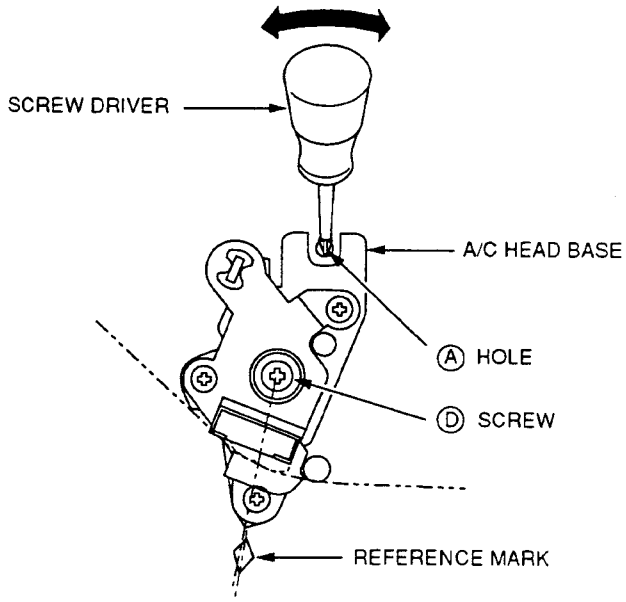


Fig. 5-14

5) Insert a philips type screwdriver into the A/C HEAD BASE and Ⓐ hole as shown in Fig. 5-14
6) Move the A/C HEAD BASE by moving a screwdriver in the direction of the arrow as shown in Fig. 5-14 to obtain the maximum RF output, then tighten the Ⓓ screw. Although there are a few points at which the RF output becomes maximum, the pointed head of the A/C HEAD BASE must be positioned as close to the reference mark as possible.
7) Eject the tape and then re-insert it and play it back again. Confirm that the RF output is maximum after the auto tracking control has been activated. Next, press the "<" or ">" button on the remote control alternately and confirm that the RF output is maximum at the tracking centre position. If the result is not satisfactory, repeat the adjustment steps 3) to 6). (This adjustment is very important as this affects the interchangeability of the recorded tapes.)

VI. PARTS LIST

ATTENTION

1. When placing an order for parts, be sure to list the Part No., Model No. and the description of earch part. Otherwise, the non-delivery of the part or the delivery of a wrong part may result.
2. Please make sure that Part No. is correct when ordering. If not, a part different from the one you ordered may be delivered.
3. Since the parts shown in Parts List or Preliminary Service Manual may have been the subject of changes, please use this Parts List for all future reference.

HOW TO USE THIS PARTS LIST

1. This Parts List lists those parts which are considered necessary for repairs. Other common parts, such as resistors and capacitors, are listed in the "Common List for Service Parts" from which these parts should be selected and stocked.
2. The Recommended Spare Parts List shows those parts in the Parts List which are considered particularly important for service.
3. Parts not shown in the Parts List and "Common List for Service Parts" will not in principle be supplied.
4. How to read the Parts List.

a) Mechanism Block

2. HEAD BASE BLOCK

Ref. No.	Part. No.	Description
1	BH-T2023A320A	HEAD BASE BLOCK
2	HP-H2206A010A	HEAD R/P PR4-8FU C
3	ZS-477876	PAN20×03STL CMT
4	ZS-536488	BID20×08STL CMT
5	ZG-402895	SP CS ANGLE ADJUST

SP (Service Parts) Classification

This number corresponds with the individual parts index number in the figure.

b) PC Board

2. MAIN PC BOARD

Ref. No.	Part. No.	Description
IC1	EI-324536	IC HD14049BP
IC2	EI-336801	IC MB8841-564M
C1A	EC-338399	C MMY V 223M 250AC [U,E,B,S]
C1B	EC-350949	C MMY V 223M 250DC [J]
C1C	EC-338397	C MMY V 223M 125AC [C,A]
X1	EI-318384	OSC X'TAL NC-18C

Symbols for primary destination
[A] : AAL (U.S.A) [S] : SAA (Australia)
[B] : BEAB (England) [U] : U/T (Universal Area)
[C] : CSA (Canada)
[E] : CEE (Europe) [V] : VDE (Germany)
[J] : JPN (Japan) [Y] : Custom

SP (Service Parts) Classification

These reference symbols correspond with component symbols in the Schematic Diagrams.

The available PC Board Blocks are listed separately.

5. When Part No. is known, Parts Index at end of Parts List can be used to locate where that part is shown in Parts List by its Reference No. listed at right of Part No.

WARNING

⚠ INDICATES SAFETY CRITICAL COMPONENTS. FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURE'S RECOMMENDED PARTS.

AVERTISSEMENT

⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT.

1. RECOMMENDED SPARE PARTS

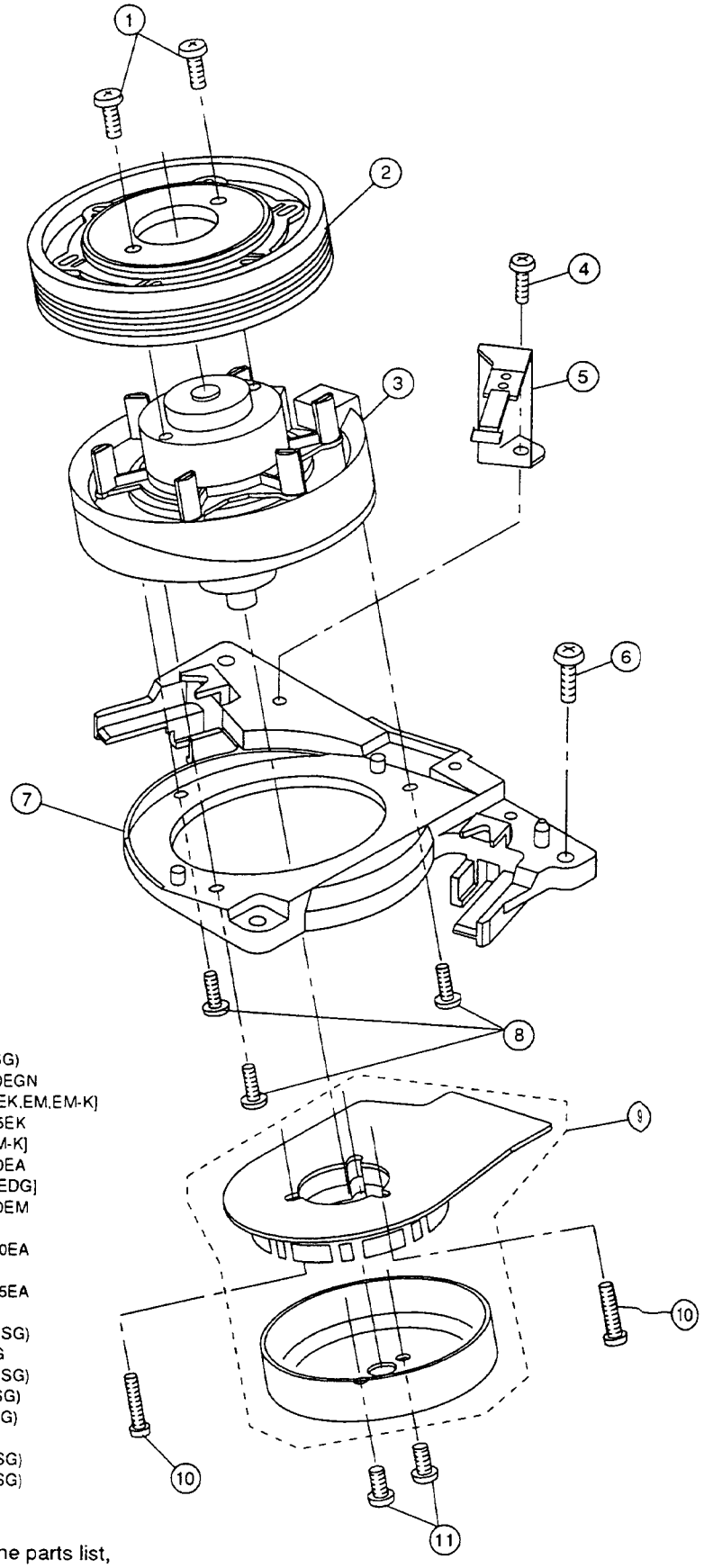
We suggest you to stock the following Recommended Spare Part items listed below since they can cover most of the routine service.

Ref. No.	Part No.	Description
1	BB-428300N	MECHA DECK GXS
2	BL-424913N06	ARM LOADING BLK G204EA
3	BL-428114N1	ARM PINCH ROLLER(2)PART
4	BM-433066N1	MOTOR E20XL16
5	BM-421746N1	MOTOR PART
6	BM-428250N2	MOTOR SCV-0604A
7	⚠ BT-432834N	TRANS POW V1222 EM [EM,EM-K]
8	⚠ BT-433085N	TRANS POW V1222EA-TM [EXCEPT EM,EM-K]
9	BV-424919N09	CASSETTE LOAD BLK G204EA
10	BV-424914N03	LEADER(S) BLK G204EA
11	BV-424915N04	LEADER(T) BLK G204EA
12	BV-425222N	RF CONVER. YAA21-1001G G/K EDG [EDG]
13	BV-427963N	RF CONVER. YAA211031G G/I/K EDI [EM-K]
14	BV-387611N	RF CONVERTER YAA21-0808G EV [EM]
15	BV-387610N	RF CONVERTER YAA21-0809G EA [EA]
16	BV-429839N	RF CONVERTER YAA21-1045H G EO [EO,EOH,EOG]
17	BV-429837N	RF CONVERTER YAA21-1046H I EK [EK]
18	BV-V1205D410A	TL LOWER DRUM BLK G220EA [2HEADS MODEL]
19	BV-V1182D410C	TL LOWER DRUM BLK G415EA [4HEADS MODEL]
20	BV-V1182D420A	TL UPPER DRUM BLK G215EK [2HEADS MODEL EK,EM,EM-K]
21	BV-V1182D420C	TL UPPER DRUM BLK G420EA [4HEADS MODEL EXCEPT EDG]
22	BV-V1205D420A	TL UPPER DRUM BLK G420EM [4HEADS MODEL EDG]
23	BV-V1123D420A	TL UPPER DRUM BLK X400EGN [2HEADS MODEL EXCEPT EK,EM,EM-K]
24	⚠ EC-416655N	C DBL LAYER T05 FM0H473Z 5.5DC
25	ED-390012N	D LED GL4800 INFRARED
26	ED-422251N	D LED GL528VTB INFRARED T05
27	ED-425369J	D SCHOTTKY AK03V0 T26
28	ED-428366N	D SCHOTTKY ERB83-004L6 S12
29	ED-428367N	D SCHOTTKY ERB84-009L6 S12
30	⚠ ED-427506N	D SILI.ERA22-10 T26 1000/0.5A
31	ED-307573N	D SILICON H 1SS131T-77 T26 [EDG,EOH,EOG]
32	ED-428420J	D SILICON RL103F-N02T05 200/1A [EXCEPT EM,EM-K]
33	ED-401046J	D SILICON RL104F-E T26 400/1A [EM,EM-K]
34	ED-403280N	D SILICON 1N4002N02 T05 100/1A
35	⚠ ED-418622N	D SILICON 1N4006N02 T05 800/1A
36	ED-422252N	D ZENER H HZS12A3L T26
37	ED-394991N	D ZENER H HZS18-3 T26 [EM,EM-K]
38	ED-428384N	D ZENER H MTZJ15C T26 [EDG,EOH,EOG]
39	ED-425278N	D ZENER H MTZJ20A T26 [EXCEPT EM,EM-K]
40	ED-428383N	D ZENER H MTZJ3.0B T26
41	ED-422519N	D ZENER H MTZJ4.3B T26
42	ED-404242N	D ZENER H MTZJ5.6A T26
43	ED-427218N	D ZENER H MTZJ6.2C T26
44	ED-404220N	D ZENER H MTZJ9.1B T26
45	EE-428336N	TV TUNER TEKB1-014A EK [G240/G245/G445EK]
46	EE-428206N	TV TUNER TEKE1-115A EGN [EM-K]
47	EE-432827N	TV TUNER TEKE1-147A EO [EO,G246EK]
48	EE-432823N	TV TUNER TEKE4-168A EOG [EDG,EOH,EOG]
49	EE-419189N	TV TUNER VTSH6AZ01 EA [EA]
50	EE-405638N	TV TUNER VTSS6CZ EM [EM]
51	⚠ EF-394702N	FUSE 218 TIME 250V 2.00A
52	EI-425188N	IC BA7630S
53	EI-429904N	IC BA7631F
54	EI-430862N	IC BA7725S
55	EI-430864N	IC BU9252S
56	EI-419278N	IC LA7285M T2T32P
57	EI-428406N	IC LA7356M-TRM FPR T12E [EDG,EM,EM-K]
58	EI-432779N	IC LA7411M-TP-T1 FPT1T24P [2HEADS MODEL]
59	EI-432778N	IC LA7416M-TP-T1 FPT1T24P [4HEADS MODEL]
60	EI-432784N	IC LA7440M [EM-K]
61	EI-432781N	IC LA7447BM [EXCEPT EM-K]
62	EI-390053N	IC LA7910 [EXCEPT G245/G445EK]
63	EI-403233N	IC LB1641
64	EI-433089N	IC LC89971-SK [EM-K]
65	EI-432780N	IC LC89975M-TE-R FPR T16E [EXCEPT EM-K]
66	EI-389471N	IC L5631 T05
67	EI-432783N	IC MM1111XF FPB T12E [EXCEPT EOG,G245/G445EDG, G240EOH(E),G254EOH(Y1), G255/G455EOH]
68	EI-433103N	IC M37774M5H389GP NXGSYPS1 [EXCEPT EK,EOG]
69	EI-433099N	IC M37774M5H390GP NXGSYPV1 [EK]
70	EI-433100N	IC M37774M5H391GP NXGSYGS1 [EOG]
71	EI-368809N	IC M51496P
72	EI-353750N	IC NJM4558MB T1 T1T32P
73	EI-428401N	IC PST9130-T T05
74	EI-428403N	IC SDA5649X FP T24E [EK,EOG,G245/G445EDG, G254/G255/G455EOH]
75	EI-422128N	IC TA76431S T05
76	EI-422145N	IC UPD16312GB-3B4
77	EI-422442N	IC 24LC02BT/SN FP T12E [EXCEPT G240EK/G245/G445EA/EDG/ EO/EOH,G246EA,G247EOG]
78	EI-431275N	IC 24LC04BT/SN FP T12E [G240EK/G245/G445EA/EDG/EO/EOH, G246EA,G247EOG]
79	EI-430866N	OSC CE CSB455E 455KHZ
80	EI-368829N	OSC CE CSB512P
81	EI-425240N	OSC X'TAL APS1011A 16.000MHZ
82	EI-431323N	OSC X'TAL C-002RX 32.768KHZ
83	EI-431006N	OSC X'TAL HC-49U GX 3.5795MH [EM-K]
84	EI-405660N	OSC X'TAL HC-49U 4.433619MHZ [EXCEPT EM-K]
85	EM-428381N	IND FL FV681G CHARACTER
86	⚠ ER-408829N	R FUSE V T05 RF25SCVTP1/4W R11K
87	⚠ ER-397385N	R FUSE V T05 RF25SCVTP1/4W R20K [EM,EM-K]
88	⚠ ER-418648N	R FUSE V T05 RF25SCVTP1/4W R24K
89	⚠ ER-400729N	R FUSE V T05 RF25SCVTP1/4W R47K
90	⚠ ER-428204N	R FUSE V T05RF25SVTP 1/4W 220J
91	ES-426275N	SW MICRO ESE11SV1A
92	ES-419326N1	SW MODE SELECT MMS00202ZMB0
93	ES-428362N	SW TACT SKHHLV
94	ES-414593N	SW TACT SOR-142HS T05
95	ET-432910N	DETECTOR GP1U271X
96	⚠ ET-422113N	PHOTO COUPLER PS2561-1-V
97	ET-429899N	TR C.DTA144TKA T146 08 E [EM-K]

Ref. No.	Part No.	Description
98	ET-430868N	TR C.DTC114EKA T146T08E [EOG,G245/G445EDG,G240EOH(E), G254EOH(Y1),G255/G455EOH]
99	ET-428400N	TR C.DTC143EKA T146T08E
100	ET-429897N	TR C.DTC144EKA T146T08E [EA,EK,EO,EM,G240/G440EDG, G240/G241/G245/G445EOH(Y1)]
101	ET-433071N	TR C.DTC144TKA T146T08E [EM-K]
102	ET-428248N	TR C.2SA1037AK R,S T146T08E [EA,EK,EO,EM,EM-K]
103	ET-416932N	TR C.2SB709A R,S TXT08E
104	ET-432740N	TR C.2SC2480 T,S TXT08E
105	ET-428373N	TR C.2SD2318 E,U,V FPTLT16E
106	ET-416933N	TR C.2SD601A R,S TXT08E
107	ET-366753N	TR DTA114ES T05
108	ET-364082N	TR DTA114TS T05
109	ET-415140N	TR DTA115TS T05
110	ET-386784N	TR DTA143TS T05
111	ET-364291N	TR DTA144ES T05 [EK,EO,G240/G440EDG,G240/G241/G245/ G445EOH(Y1)]
112	ET-364023N	TR DTC114ES T05
113	ET-364492N	TR DTC114TS T05 [EXCEPT EA,EM]
114	ET-354365	TR DTC114YS
115	ET-361901N	TR DTC124ES T05
116	ET-368786N	TR DTC143ZS T05
117	ET-361961N	TR DTC144ES T05
118	ET-373201N	TR DTC144TS T05 [EDG,EOH,EOG]
119	⚠ET-427538N	TR FET 2SK2056 LBS2AKAI [EM,EM-K]
120	ET-390010N	TR PHOTO PT4800
121	ET-390009N	TR PHOTO PT493F
122	ET-392746N1	TR 2SA933AS R,S T05 [EA,EM]
123	ET-392663N	TR 2SC1740S R,S T05 [EDG,EOH,EOG]
124	ET-419014N	TR 2SC1741S Q,R T05
125	ET-414816N	TR 2SC2668 Y T05
126	⚠ET-428407N	TR 2SC3616 M,L T05 [EM,EM-K]
127	⚠ET-428371N	TR 2SC4908 [EXCEPT EM,EM-K]
128	⚠ET-422129N	TR 2SD2132 U,V T05 [EXCEPT EM,EM-K]
129	ET-416697N	TR 2SD2396 J,K
130	EW-432812N	CORD FFC BD P1.25 L130 14P [2HEADS MODEL]
131	EW-422530J	CORD FFC BD P1.25 L150 18P [4HEADS MODEL]
132	HE-422168N	HEAD E HVFHF0040A
133	HR-416732N	HEAD COMBO HVMZA1201A
134	MB-420053N	BELT CAPSTAN
135	MI-420023N3	ARM IDLER PART
136	MI-420038N4	DISK CLUTCH PART
137	MI-420037N	DISK COUPLING
138	ML-420068N1	ARM REVIEW PART
139	ML-426550N	ARM F/R COUPLING
140	ML-420170N	ARM LID OPENER
141	ML-420097N3	ARM LOADING BRAKE
142	ML-420102N1	ARM T.U BRAKE
143	ML-420006N2	ARM TENSION PART
144	ML-428102N1	LEVER CAM PINCH
145	ML-420099N2	LEVER M BRAKE
146	ML-420133N2	LEVER REC-S
147	ML-420416N3	LEVER TENSION(1)PART
148	ML-420086N1	MAIN BRAKE(S)PART
149	ML-420089N1	MAIN BRAKE(T)PART
150	ML-420092N1	REVIEW BRAKE PART
151	ML-420110N4	SLIDER PINCH
152	ML-420100N3	SLIDER TRIGGER
153	ML-428108N	STILL BRAKE PART
154	MR-420109N	HOLDER THRUST WORM
155	MR-420106N	PULLEY TRIGGER
156	MR-420022N	ROLLER IMPEDANCE
157	MT-424632N2	DISK(2) PART
158	MZ-420064N1	GEAR CAM HELICAL
159	MZ-420122N1	GEAR CAM MAIN
160	MZ-428103N	GEAR CAM R-204
161	MZ-420035N	GEAR COUPLING
162	MZ-420124N3	GEAR FRONT LOADING
163	MZ-420067N	GEAR PINCH
164	MZ-424917N03	GEAR TOGGLE (S) BLK G204EA
165	MZ-424916N04	GEAR TOGGLE (T) BLK G204EA
166	MZ-420123N	GEAR WORM WHEEL
167	MZ-420132N3	PRISM LED
168	MZ-420016N2	TENSION BAND PART
169	ZG-420036N	SP PUSH COUPLING
170	ZG-420105N	SP TRIGGER

Ref. No.	Part No.	Description
98	ET-430868N	TR C.DTC114EKA T146T08E [EOG,G245/G445EDG,G240EOH(E), G254EOH(Y1),G255/G455EOH]
99	ET-428400N	TR C.DTC143EKA T146T08E
100	ET-429897N	TR C.DTC144EKA T146T08E [EA,EK,EO,EM,G240/G440EDG, G240/G241/G245/G445EOH(Y1)]
101	ET-433071N	TR C.DTC144TKA T146T08E [EM-K]
102	ET-428248N	TR C.2SA1037AK R,S T146T08E [EA,EK,EO,EM,EM-K]
103	ET-416932N	TR C.2SB709A R,S TXT08E
104	ET-432740N	TR C.2SC2480 T,S TXT08E
105	ET-428373N	TR C.2SD2318 E,U,V FPTLT16E
106	ET-416933N	TR C.2SD601A R,S TXT08E
107	ET-366753N	TR DTA114ES T05
108	ET-364082N	TR DTA114TS T05
109	ET-415140N	TR DTA115TS T05
110	ET-386784N	TR DTA143TS T05
111	ET-364291N	TR DTA144ES T05 [EK,EO,G240/G440EDG,G240/G241/G245/ G445EOH(Y1)]
112	ET-364023N	TR DTC114ES T05
113	ET-364492N	TR DTC114TS T05 [EXCEPT EA,EM]
114	ET-354365	TR DTC114YS
115	ET-361901N	TR DTC124ES T05
116	ET-368786N	TR DTC143ZS T05
117	ET-361961N	TR DTC144ES T05
118	ET-373201N	TR DTC144TS T05 [EDG,EOH,EOG]
119	⚠ET-427538N	TR FET 2SK2056 LBS2AKAI [EM,EM-K]
120	ET-390010N	TR PHOTO PT4800
121	ET-390009N	TR PHOTO PT493F
122	ET-392746N1	TR 2SA933AS R,S T05 [EA,EM]
123	ET-392663N	TR 2SC1740S R,S T05 [EDG,EOH,EOG]
124	ET-419014N	TR 2SC1741S Q,R T05
125	ET-414816N	TR 2SC2668 Y T05
126	⚠ET-428407N	TR 2SC3616 M,L T05 [EM,EM-K]
127	⚠ET-428371N	TR 2SC4908 [EXCEPT EM,EM-K]
128	⚠ET-422129N	TR 2SD2132 U,V T05 [EXCEPT EM,EM-K]
129	ET-416697N	TR 2SD2396 J,K
130	EW-432812N	CORD FFC BD P1.25 L130 14P [2HEADS MODEL]
131	EW-422530J	CORD FFC BD P1.25 L150 18P [4HEADS MODEL]
132	HE-422168N	HEAD E HVFHF0040A
133	HR-416732N	HEAD COMBO HVMZA1201A
134	MB-420053N	BELT CAPSTAN
135	MI-420023N3	ARM IDLER PART
136	MI-420038N4	DISK CLUTCH PART
137	MI-420037N	DISK COUPLING
138	ML-420068N1	ARM REVIEW PART
139	ML-426550N	ARM F/R COUPLING
140	ML-420170N	ARM LID OPENER
141	ML-420097N3	ARM LOADING BRAKE
142	ML-420102N1	ARM T.U BRAKE
143	ML-420006N2	ARM TENSION PART
144	ML-428102N1	LEVER CAM PINCH
145	ML-420099N2	LEVER M BRAKE
146	ML-420133N2	LEVER REC-S
147	ML-420416N3	LEVER TENSION(1)PART
148	ML-420086N1	MAIN BRAKE(S)PART
149	ML-420089N1	MAIN BRAKE(T)PART
150	ML-420092N1	REVIEW BRAKE PART
151	ML-420110N4	SLIDER PINCH
152	ML-420100N3	SLIDER TRIGGER
153	ML-428108N	STILL BRAKE PART
154	MR-420109N	HOLDER THRUST WORM
155	MR-420106N	PULLEY TRIGGER
156	MR-420022N	ROLLER IMPEDANCE
157	MT-424632N2	DISK(2) PART
158	MZ-420064N1	GEAR CAM HELICAL
159	MZ-420122N1	GEAR CAM MAIN
160	MZ-428103N	GEAR CAM R-204
161	MZ-420035N	GEAR COUPLING
162	MZ-420124N3	GEAR FRONT LOADING
163	MZ-420067N	GEAR PINCH
164	MZ-424917N03	GEAR TOGGLE (S) BLK G204EA
165	MZ-424916N04	GEAR TOGGLE (T) BLK G204EA
166	MZ-420123N	GEAR WORM WHEEL
167	MZ-420132N3	PRISM LED
168	MZ-420016N2	TENSION BAND PART
169	ZG-420036N	SP PUSH COUPLING
170	ZG-420105N	SP TRIGGER

HEAD DRUM BLOCK

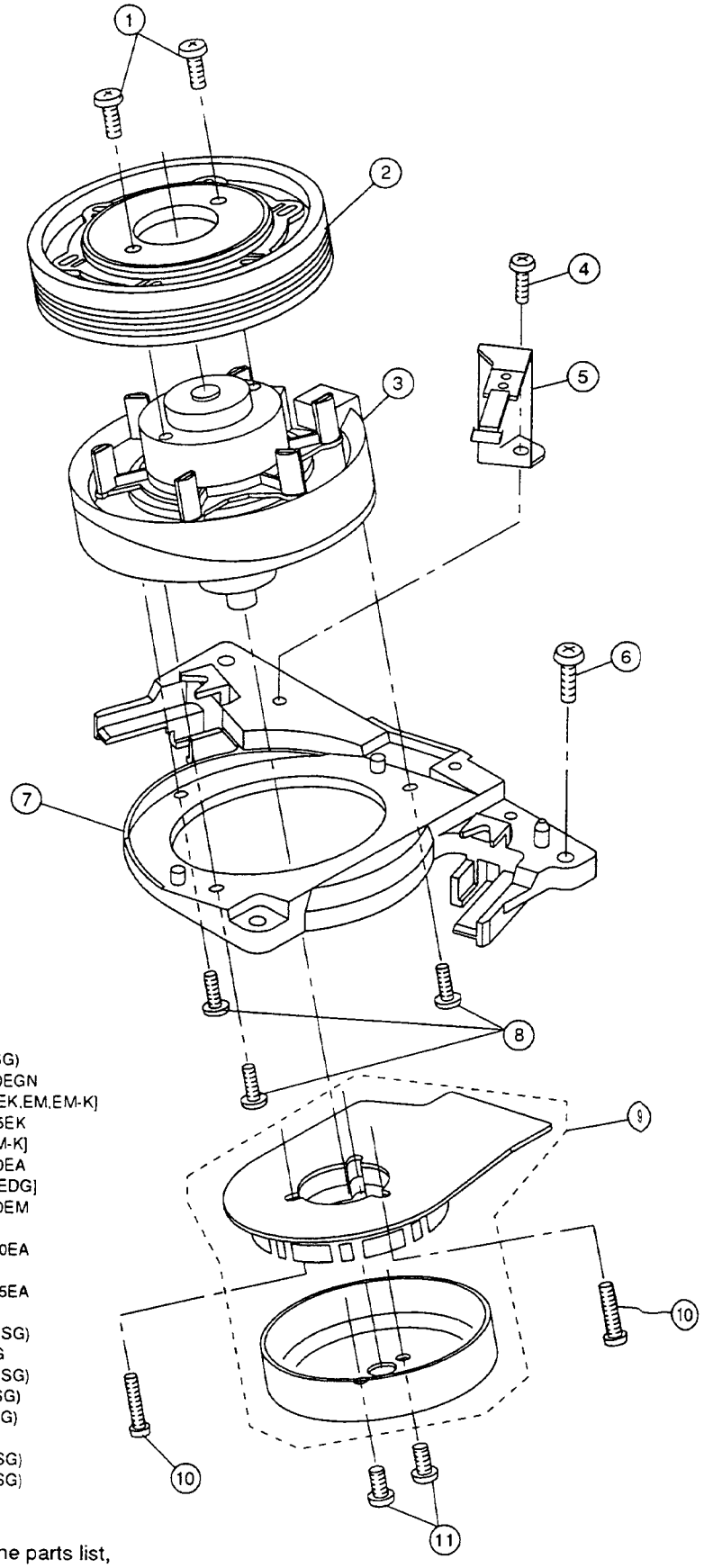


2. HEAD DRUM BLOCK

Ref. No.	Part No.	Description
1	ZS-321298N	BID30X08STL CMT (SG)
2-A	BV-V1123D420A	TL UPPER DRUM BLK X400EGN [2HEADS MODEL EXCEPT EK,EM,EM-K]
2-B	BV-V1182D420A	TL UPPER DRUM BLK G215EK [2HEADS MODEL EK,EM,EM-K]
2-C	BV-V1182D420C	TL UPPER DRUM BLK G420EA [4HEADS MODEL EXCEPT EDG]
2-D	BV-V1205D420A	TL UPPER DRUM BLK G420EM [4HEADS MODEL EDG]
3-A	BV-V1205D410A	TL LOWER DRUM BLK G220EA [2HEADS MODEL]
3-B	BV-V1182D410C	TL LOWER DRUM BLK G415EA [4HEADS MODEL]
4	ZS-358936N	ST BID30X06STL CMT (SG)
5	VT-418700J1	EARTH BRUSH (2) PART AG
6	ZS-336714N	ST BID30X12STL CMT (SG)
7	MA-429081N1	CHASSIS DRUM(A) (SG)
8	ZS-563444N	BID26X08STL CMT (SG)
9	BM-433066N1	MOTOR E20XL16
10	ZS-467796N	PAN26X12STL CMT (SG)
11	ZS-379350N	PAN30X06STL CMT (SG)

NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

HEAD DRUM BLOCK

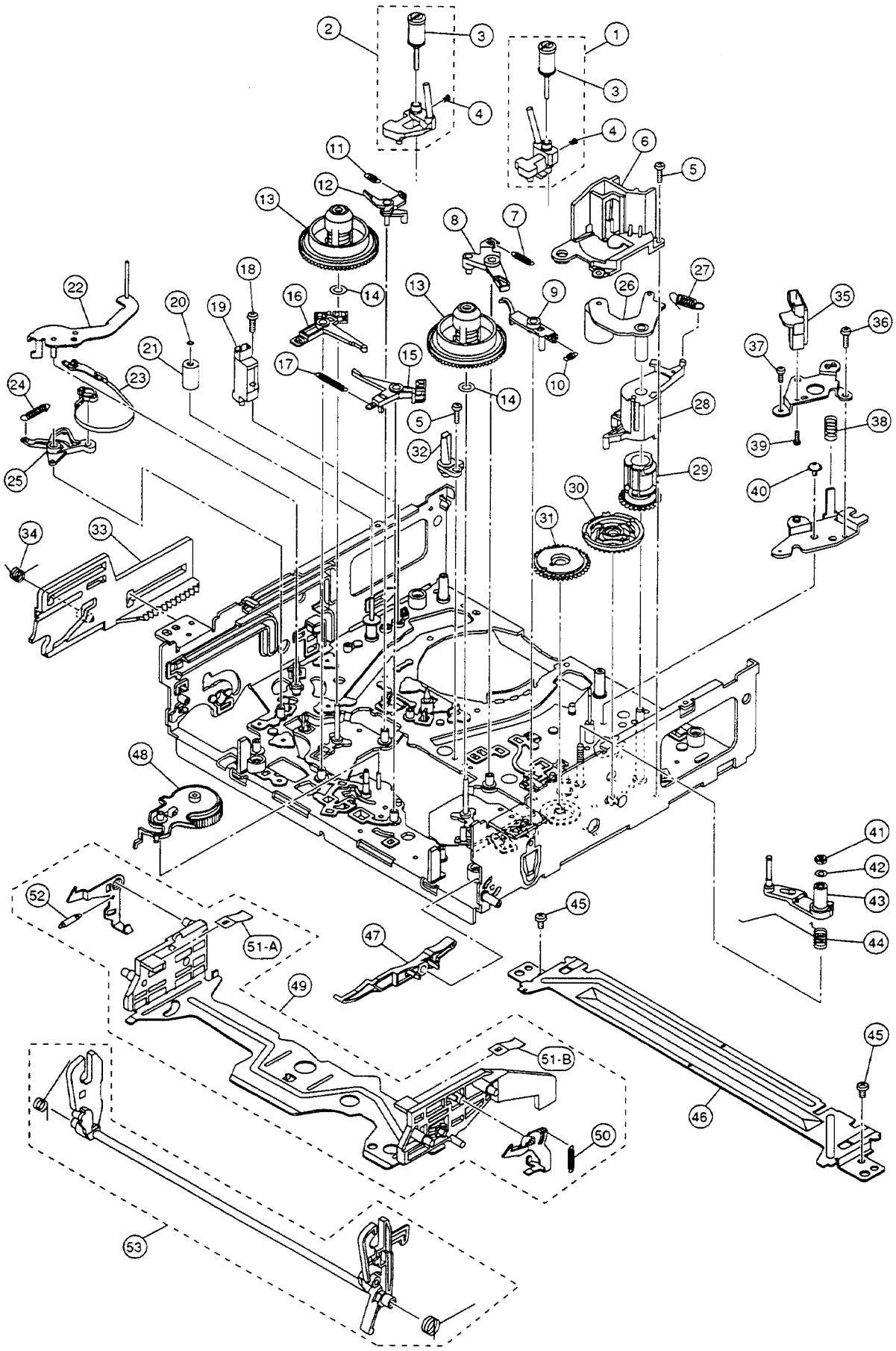


2. HEAD DRUM BLOCK

Ref. No.	Part No.	Description
1	ZS-321298N	BID30X08STL CMT (SG)
2-A	BV-V1123D420A	TL UPPER DRUM BLK X400EGN [2HEADS MODEL EXCEPT EK,EM,EM-K]
2-B	BV-V1182D420A	TL UPPER DRUM BLK G215EK [2HEADS MODEL EK,EM,EM-K]
2-C	BV-V1182D420C	TL UPPER DRUM BLK G420EA [4HEADS MODEL EXCEPT EDG]
2-D	BV-V1205D420A	TL UPPER DRUM BLK G420EM [4HEADS MODEL EDG]
3-A	BV-V1205D410A	TL LOWER DRUM BLK G220EA [2HEADS MODEL]
3-B	BV-V1182D410C	TL LOWER DRUM BLK G415EA [4HEADS MODEL]
4	ZS-358936N	ST BID30X06STL CMT (SG)
5	VT-418700J1	EARTH BRUSH (2) PART AG
6	ZS-336714N	ST BID30X12STL CMT (SG)
7	MA-429081N1	CHASSIS DRUM(A) (SG)
8	ZS-563444N	BID26X08STL CMT (SG)
9	BM-433066N1	MOTOR E20XL16
10	ZS-467796N	PAN26X12STL CMT (SG)
11	ZS-379350N	PAN30X06STL CMT (SG)

NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

MECHANISM (1) BLOCK



3. MECHANISM (1) BLOCK

Ref. No.	Part No.	Description
1	BV-424915N04	LEADER(T) BLK G204EA
2	BV-424914N03	LEADER(S) BLK G204EA
3	VT-387394N3	GUIDE ROLLER D8 PART
4	ZS-418616J	PAN20X2.8STL CMT PS1 LEADER
5	ZS-383761J	ST BID26X06STL CMT
6	MZ-428101N	HOLDER CAM PINCH
7	ZG-420095N	SP PULL REVIEW BRAKE
8	ML-420092N1	REVIEW BRAKE PART
9	ML-420102N1	ARM T.U BRAKE
10	ZG-420103N1	SP PULL T.U BRAKE
11	ZG-420098N	SP PULL LOADING BRAKE
12	ML-420097N3	ARM LOADING BRAKE
13	MT-424632N2	DISK(2) PART
14	ZW-424667N	REEL WASHER
15	ML-420089N1	MAIN BRAKE(T)PART
16	ML-420086N1	MAIN BRAKE(S)PART
17	ZG-420091N	SP PULL MAIN BRAKE
18	ZS-403887N	PT BID26X12STL CMT (SG)
19	HE-422168N	HEAD E HVFHF0040A
20	ZW-395919J	SLIT W16X035X025 PSL
21	MR-420022N	ROLLER IMPEDANCE
22	ML-420006N2	ARM TENSION PART
23	MZ-420016N2	TENSION BAND PART
24	ZG-420015N1	SP PULL TENSION(1)
25	ML-420416N3	LEVER TENSION(1)PART
26	BL-428114N1	ARM PINCH ROLLER(2)PART
27	ZG-428105N1	SP PULL PINCH ROLLER
28	ML-428102N1	LEVER CAM PINCH
29	MZ-420064N1	GEAR CAM HELICAL
30	MZ-428103N	GEAR CAM R-204
31	MZ-420067N	GEAR PINCH
32	MZ-420132N3	PRISM LED
33	ML-420168N1	SLIDER FRONT LOADING
34	ZG-420169N1	SP TORSION SLIDER
35	HR-416732N	HEAD COMBO HVMZA1201A
36	ZS-575392	PAN26X08STL CMT
37	ZS-422170J	PAN26X07STL CMT CP
38	ZG-420075N	SP PUSH A/C
39	ZS-418480J	PAN20X2.2STL BZN PS1
40	ZS-362533	ST PAN30X05STL CMT C080
41	ZW-350839	N30 NYLON
42	ZW-324417	PW31X060X050PSL
43	ML-420068N1	ARM REVIEW PART
44	ZG-420071N1	SP TORSION REVIEW
45	ZS-358936N	ST BID30X06STL CMT (SG)
46	MZ-420172N2	PLATE UPPER
47	ML-420170N	ARM LID OPENER
48	MI-420023N3	ARM IDLER PART
49	BV-424919N09	CASSETTE LOAD BLK G204EA
50	ZG-420167N1	SP PULL DUMPER(T)
51-A	ZG-426481N	SP PLATE UPPER(S)
51-B	ZG-425178N	SP PLATE UPPER(T)
52	ZG-420166N	SP PULL DUMPER(S)
53	BL-424913N06	ARM LOADING BLK G204EA
55	BB-428300N	MECHA DECK GXS

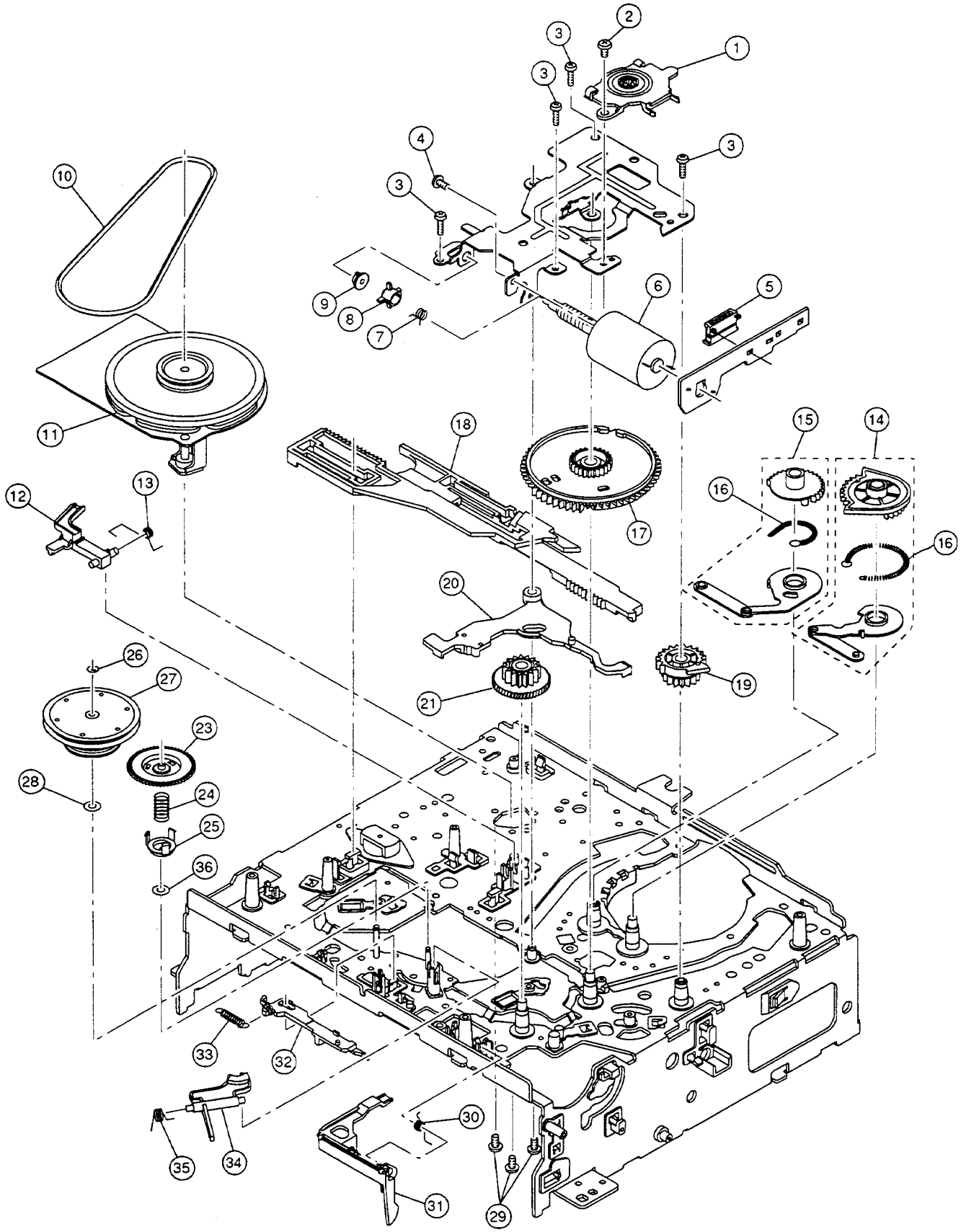
NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

3. MECHANISM (1) BLOCK

Ref. No.	Part No.	Description
1	BV-424915N04	LEADER(T) BLK G204EA
2	BV-424914N03	LEADER(S) BLK G204EA
3	VT-387394N3	GUIDE ROLLER D8 PART
4	ZS-418616J	PAN20X2.8STL CMT PS1 LEADER
5	ZS-383761J	ST BID26X06STL CMT
6	MZ-428101N	HOLDER CAM PINCH
7	ZG-420095N	SP PULL REVIEW BRAKE
8	ML-420092N1	REVIEW BRAKE PART
9	ML-420102N1	ARM T.U BRAKE
10	ZG-420103N1	SP PULL T.U BRAKE
11	ZG-420098N	SP PULL LOADING BRAKE
12	ML-420097N3	ARM LOADING BRAKE
13	MT-424632N2	DISK(2) PART
14	ZW-424667N	REEL WASHER
15	ML-420089N1	MAIN BRAKE(T)PART
16	ML-420086N1	MAIN BRAKE(S)PART
17	ZG-420091N	SP PULL MAIN BRAKE
18	ZS-403887N	PT BID26X12STL CMT (SG)
19	HE-422168N	HEAD E HVFHF0040A
20	ZW-395919J	SLIT W16X035X025 PSL
21	MR-420022N	ROLLER IMPEDANCE
22	ML-420006N2	ARM TENSION PART
23	MZ-420016N2	TENSION BAND PART
24	ZG-420015N1	SP PULL TENSION(1)
25	ML-420416N3	LEVER TENSION(1)PART
26	BL-428114N1	ARM PINCH ROLLER(2)PART
27	ZG-428105N1	SP PULL PINCH ROLLER
28	ML-428102N1	LEVER CAM PINCH
29	MZ-420064N1	GEAR CAM HELICAL
30	MZ-428103N	GEAR CAM R-204
31	MZ-420067N	GEAR PINCH
32	MZ-420132N3	PRISM LED
33	ML-420168N1	SLIDER FRONT LOADING
34	ZG-420169N1	SP TORSION SLIDER
35	HR-416732N	HEAD COMBO HVMZA1201A
36	ZS-575392	PAN26X08STL CMT
37	ZS-422170J	PAN26X07STL CMT CP
38	ZG-420075N	SP PUSH A/C
39	ZS-418480J	PAN20X2.2STL BZN PS1
40	ZS-362533	ST PAN30X05STL CMT C080
41	ZW-350839	N30 NYLON
42	ZW-324417	PW31X060X050PSL
43	ML-420068N1	ARM REVIEW PART
44	ZG-420071N1	SP TORSION REVIEW
45	ZS-358936N	ST BID30X06STL CMT (SG)
46	MZ-420172N2	PLATE UPPER
47	ML-420170N	ARM LID OPENER
48	MI-420023N3	ARM IDLER PART
49	BV-424919N09	CASSETTE LOAD BLK G204EA
50	ZG-420167N1	SP PULL DUMPER(T)
51-A	ZG-426481N	SP PLATE UPPER(S)
51-B	ZG-425178N	SP PLATE UPPER(T)
52	ZG-420166N	SP PULL DUMPER(S)
53	BL-424913N06	ARM LOADING BLK G204EA
55	BB-428300N	MECHA DECK GXS

NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

MECHANISM (2) BLOCK



4. MECHANISM (2) BLOCK

Ref. No.	Part No.	Description
1	ES-419326N1	SW MODE SELECT MMS00202ZMB0
2	ZS-358936N	ST BID30X06STL CMT (SG)
3	ZS-389950N	PT BID26X10STL CMT (SG)
4	ZS-425981	BID30X03STL CMT
5	EJ-422169J	SOCKET TKC-M07X-A17P
6	BM-421746N1	MOTOR PART
7	ZG-420105N	SP TRIGGER
8	MR-420106N	PULLEY TRIGGER
9	MR-420109N	HOLDER THRUST WORM
10	MB-420053N	BELT CAPSTAN
11	BM-428250N2	MOTOR SCV-0604A
12	ML-428108N	STILL BRAKE PART
13	ZG-428110N	SP TORSION S.B
14	MZ-424917N03	GEAR TOGGLE (S) BLK G204EA
15	MZ-424916N04	GEAR TOGGLE (T) BLK G204EA
16	ZG-420117N	SP PULL TOGGLE
17	MZ-420122N1	GEAR CAM MAIN
18	ML-420110N4	SLIDER PINCH
19	MZ-420124N3	GEAR FRONT LOADING
20	ML-420099N2	LEVER M BRAKE
21	MZ-420123N	GEAR WORM WHEEL
23	MZ-420035N	GEAR COUPLING
24	ZG-420036N	SP PUSH COUPLING
25	MI-420037N	DISK COUPLING
26	ZW-418816J	SLIT W21X050X050PSL
27	MI-420038N4	DISK CLUTCH PART
28	ZW-389923J	PW26X060X050PSL
29	ZS-432843N	PAN26X04STL CMT (SG)
30	ZG-420134N1	SP TORSION REC-S
31	ML-420133N2	LEVER REC-S
32	ML-420100N3	SLIDER TRIGGER
33	ZG-420101N	SP PULL TRIGGER
34	ML-426550N	ARM F/R COUPLING
35	ZG-420034N2	SP TORSION COUPLING
36	ZW-321317	PW21X040X050PSL

NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

5. P.C. BOARD BLOCK

Ref. No.	Part No.	Description
1-A	BA-V1222V600B	NS PC(#) MAIN BLK G245EA [G240/G245/G246EA]
1-B	BA-V1222V600C	NS PC(#) MAIN BLK G240EDG
1-C	BA-V1222V600G	NS PC(#) MAIN BLK G240EK
1-D	BA-V1224V600F	NS PC(#) MAIN BLK G240EOH(E)
1-E	BA-V1222V600J	NS PC(#) MAIN BLK G240EM
1-F	BA-V1222V600H	NS PC(#) MAIN BLK G241EOH(Y1) [G240/G241EOH[Y1]]
1-G	BA-V1224V600C	NS PC(#) MAIN BLK G245EDG
1-H	BA-V1222V600D	NS PC(#) MAIN BLK G245EK
1-I	BA-V1222V600E	NS PC(#) MAIN BLK G245EO
1-J	BA-V1222V600L	NS PC(#) MAIN BLK G245EOH(Y1)
1-K	BA-V1224V600D	NS PC(#) MAIN BLK G247EOG [G247/G257EOG]
1-L	BA-V1222V600K	NS PC(#) MAIN BLK G250EM-K
1-M	BA-V1224V600H	NS PC(#) MAIN BLK G254EOH(Y1) [G254/G255EOH]
1-N	BA-V1222V600F	NS PC(#) MAIN BLK G246EK
1-O	BA-V1226V600B	NS PC(#) MAIN BLK G445EA [G440/G445EA]
1-P	BA-V1226V600C	NS PC(#) MAIN BLK G440EDG
1-Q	BA-V1227V600C	NS PC(#) MAIN BLK G445EDG
1-R	BA-V1226V600D	NS PC(#) MAIN BLK G445EK
1-S	BA-V1226V600E	NS PC(#) MAIN BLK G445EO
1-T	BA-V1226V600F	NS PC(#) MAIN BLK G445EOH(Y1)
1-U	BA-V1227V600H	NS PC(#) MAIN BLK G455EOH(Y1)
1-V	BA-V1227V600E	NS PC(#) MAIN BLK G457EOG
2-A	BA-F5001V040A	NS PC VIF-NOR BLK NOR-EA [EA]
2-B	BA-F5001V030A	NS PC VIF-EDG BLK NOR-EDG [EDG]
2-C	BA-F5001V040F	NS PC VIF-NOR BLK NOR-EOG [EO,EOH,EOG]
2-D	BA-F5001V040C	NS PC VIF-NOR BLK NOR-EM [EM]
2-E	BA-F5001V040B	NS PC VIF-NOR BLK NOR-EK [G240/G245/G445EK]
2-F	BA-F5001V030B	NS PC VIF-EDG BLK NOR-EM-K [EM-K]
2-G	BA-F5001V040D	NS PC VIF-NOR BLK NOR-ES [G246EK]

PC (#) MAIN BLK CONSISTIS OF FOLLOWING P.C. BOARDS.

- MAIN P.C. BOARD
- PRE-AMP P.C. BOARD
- DETECT P.C. BOARD
- VIF BLK

6. MAIN P.C. BOARD

Ref. No.	Part No.	Description
C201	⚠ EC-422101N	C MMY V CUT MKTR40 104M 275AC
C202	⚠ EC-422101N	C MMY V CUT MKTR40 104M 275AC
C204	⚠ EC-418706N	C CE V CUT CS11 E222M 400AC [EK,EO,EOH,EOG]
C205	⚠ EC-418706N	C CE V CUT CS11 E222M 400AC
C206	⚠ EC-418706N	C CE V CUT CS11 E222M 400AC
C207	⚠ EC-418706N	C CE V CUT CS11 E222M 400AC
C208	⚠ EC-418706N	C CE V CUT CS11 E222M 400AC [EK,EO,EOH,EOG]
C209	⚠ EC-418706N	C CE V CUT CS11 E222M 400AC
C210-A	EC-432918N	C EC V CUT YK 330M 400.0DC [EXCEPT EM,EM-K]
C210-B	EC-422104N	C EC V CUT USW18 820M 400.0DC [EM,EM-K]
C211	⚠ EC-428385N	C MMY V T05 MMCV 473K 400DC
C212	⚠ EC-418759N	C CE V T05 CC45 SL121K 1000DC
C213	EC-422421N	C EC V T05 SSP 4R7M 50.0DC
C220	EC-422106N	C EC V CUT YXB12 222M 6.3DC
C222	EC-422107N	C EC V CUT YXB10 471M 25.0DC
C236	EC-431086N	C EC V CUT TWSS 102M 16.0DC
C436	⚠ EC-416655N	C DBL LAYER T05 FM0H473Z 5.5DC
D3	ED-307573N	D SILICON H 1SS131T-77 T26 [EDG,EOH,EOG]
D4	ED-428384N	D ZENER H MTZJ15C T26 [EDG,EOH,EOG]
D201	⚠ ED-418622N	D SILICON 1N4006N02 T05 800/1A
D202	⚠ ED-418622N	D SILICON 1N4006N02 T05 800/1A
D203	⚠ ED-418622N	D SILICON 1N4006N02 T05 800/1A
D204	⚠ ED-418622N	D SILICON 1N4006N02 T05 800/1A
D205	⚠ ED-427506N	D SILI.ERA22-10 T26 1000/0.5A
D207	ED-307573N	D SILICON H 1SS131T-77 T26
D208	ED-425369J	D SCHOTTKY AK03V0 T26
D209-A	ED-428420J	D SILICON RL103F-N02T05 200/1A [EXCEPT EM,EM-K]
D209-B	ED-401046J	D SILICON RL104F-E T26 400/1A [EM,EM-K]
D210	ED-428366N	D SCHOTTKY ERB83-004L6 S12
D212	ED-428367N	D SCHOTTKY ERB84-009L6 S12
D214-A	ED-428420J	D SILICON RL103F-N02T05 200/1A [EXCEPT EM,EM-K]
D214-B	ED-401046J	D SILICON RL104F-E T26 400/1A [EM,EM-K]
D215-A	ED-425278N	D ZENER H MTZJ20A T26 [EXCEPT EM,EM-K]
D215-B	ED-394991N	D ZENER H HZS18-3 T26 [EM,EM-K]
D218	ED-307573N	D SILICON H 1SS131T-77 T26
D219	ED-422519N	D ZENER H MTZJ4.3B T26
D220	ED-403280N	D SILICON 1N4002N02 T05 100/1A
D221	ED-403280N	D SILICON 1N4002N02 T05 100/1A
D225	ED-422252N	D ZENER H HZS12A3L T26
D229	ED-404242N	D ZENER H MTZJ5.6A T26
D230	ED-404242N	D ZENER H MTZJ5.6A T26
D231	ED-307573N	D SILICON H 1SS131T-77 T26
D232	ED-307573N	D SILICON H 1SS131T-77 T26
D301	ED-307573N	D SILICON H 1SS131T-77 T26 [EM-K]
D401	ED-422251N	D LED GL528VTB INFRARED T05
D402	ED-390012N	D LED GL4800 INFRARED
D403	ED-390012N	D LED GL4800 INFRARED
D404	ED-427218N	D ZENER H MTZJ6.2C T26
D405	ED-307573N	D SILICON H 1SS131T-77 T26
D406	ED-307573N	D SILICON H 1SS131T-77 T26
D410	ED-307573N	D SILICON H 1SS131T-77 T26
D411	ED-428383N	D ZENER H MTZJ3.0B T26
D412	ED-307573N	D SILICON H 1SS131T-77 T26
D413	ED-307573N	D SILICON H 1SS131T-77 T26
D601	ED-307573N	D SILICON H 1SS131T-77 T26
D602	ED-307573N	D SILICON H 1SS131T-77 T26
D603	ED-307573N	D SILICON H 1SS131T-77 T26 [EM,EM-K,G245/G246EK]
FL330	EO-427540N	COIL OSC 1 V1205-087 70.0KHZ
FL401	EM-428381N	IND FL FV681G CHARACTER
FR201	⚠ ER-397385N	R FUSE V T05 RF25SCVTP1/4WR20K [EM,EM-K]
FR202	⚠ ER-418648N	R FUSE V T05 RF25SCVTP1/4WR24K
FR203	⚠ ER-400729N	R FUSE V T05 RF25SCVTP1/4WR47K
FR204	⚠ ER-428204N	R FUSE V T05RF25SVTP 1/4W 220J
FR206	⚠ ER-408829N	R FUSE V T05 RF25SCVTP1/4WR11K
FR401	⚠ ER-400729N	R FUSE V T05 RF25SCVTP1/4WR47K
F201	⚠ EF-394702N	FUSE 218 TIME 250V 2.00A
IC1	EI-389471N	IC L5631 T05
IC2	EI-390053N	IC LA7910 [EXCEPT G245/G445EK]
IC101	EI-432783N	IC MM1111XF FPB T12E [EXCEPT EOG,G245/G445EDG, G240EOH(E),G254EOH(Y1),G255/ G455EOH]
IC201	EI-422128N	IC TA76431S T05
IC301	EI-419278N	IC LA7285M T2T32P
IC401-A	EI-433103N	IC M37774M5H389GP NXGSYPS1 [EXCEPT EK,EOG]
IC401-B	EI-433099N	IC M37774M5H390GP NXGSYPV1 [EK]
IC401-C	EI-433100N	IC M37774M5H391GP NXGSYGS1 [EOG]

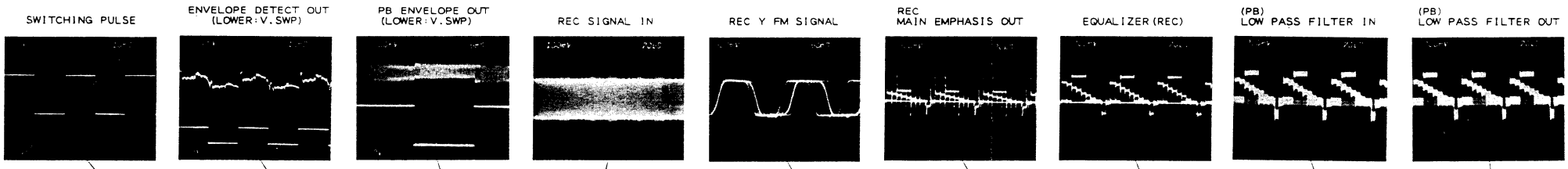
Ref. No.	Part No.	Description
IC402	EI-353750N	IC NJM4558MB T1 T1T32P
IC403	EI-403233N	IC LB1641
IC404-A	EI-422442N	IC 24LC02BT/SN FP T12E [EXCEPT G240EK,G245/G445EA/EDG/ EO/EOH,G246EA,G247EOG]
IC404-B	EI-431275N	IC 24LC04BT/SN FP T12E [G240EK,G245/G445EA/EDG/EO/EOH, G246EA,G247EOG]
IC405	EI-422145N	IC UPD16312GB-3B4
IC406	EI-428401N	IC PST9130-T T05
IC407	EI-428403N	IC SDA5649X FP T24E [EK,EOG,G245/G445EDG,G254/G255/ G455EOH]
IC601-A	EI-432781N	IC LA7447BM [EXCEPT EM-K]
IC601-B	EI-432784N	IC LA7440M [EM-K]
IC696	EI-433089N	IC LC89971-SK [EM-K]
IC697	EI-432780N	IC LC89975M-TE-R FPR T16E [EXCEPT EM-K]
IC751	EI-428406N	IC LA7356M-TRM FPR T12E [EDG,EM,EM-K]
L1	EO-390849N	COIL FIX 1 LF-5.0S T26 4R7K [EA,EM,EM-K,EO,G246EK]
L2-A	EO-379354N	COIL FIX 1 LAP02TA T26 1R0K [EA]
L2-B	EO-425199N	COIL FIX 1 LF-5.0S T26 R68K [EM,G240/G245/G445EK]
L2-C	EO-424201N	COIL FIX 1 LF-5.0S T26 R47K [EM-K]
L3	EO-422488N	COIL FIX 1 LF-5.0S T26 100J [EO]
L101	EO-345881N	COIL FIX 1 EL0606SKI 101J [EA,EK,EM,EM-K,EO,G240/G241/G245/ G445EOH(Y1)]
L201	⚠ EO-428349N	COIL LF UF1922C4-152Y1R5-01 [EK,EO,EOH,EOG]
L202	⚠ EO-428417N	COIL LF HF2022-333Y0R3-01
L203	EO-422134N	COIL FIX 2 PC7-330K 330K
L205	EO-422134N	COIL FIX 2 PC7-330K 330K
L352-A	EO-403270N	COIL FIX 1 EL0405RA T05 101J [EDG,EK,EOH,EOG,G240/G245/G445EK]
L352-B	EO-426410N	COIL FIX 1 LHL06TB T05 561K [EA,EM,EM-K,EO,G246EK]
L401	EO-432682N	COIL FIX 1 EL0405RA T05 220J
L402	EO-414830N	COIL FIX 1 LAP02TA T26 220J
L601	EO-422479N	COIL FIX 1 LF-5.0S T26 330J
L602	EO-345881N	COIL FIX 1 EL0606SKI 101J
L603	EO-422473N	COIL FIX 1 LF-5.0S T26 680J
L605	EO-422479N	COIL FIX 1 LF-5.0S T26 330J [EXCEPT EA,EK]
L606	EO-422477N	COIL FIX 1 LF-5.0S T26 470J
L610	EO-422478N	COIL FIX 1 LF-5.0S T26 390J [EM-K]
L651	EO-422478N	COIL FIX 1 LF-5.0S T26 390J
L652	EO-422477N	COIL FIX 1 LF-5.0S T26 470J
L653	EO-422488N	COIL FIX 1 LF-5.0S T26 100J
L654	EO-428358N	COIL FIX 1 LF-5.0S T26 221J
L671	EO-422473N	COIL FIX 1 LF-5.0S T26 680J
L672	EO-428358N	COIL FIX 1 LF-5.0S T26 221J
L673	EO-428360N	COIL FIX 1 LF-5.0S T26 331J
L674	EO-422476N	COIL FIX 1 LF-5.0S T26 5R6J
L675	EO-345881N	COIL FIX 1 EL0606SKI 101J
L676	EO-425203N	COIL FIX 1 LF-5.0S T26 4R7J
L677	EO-425203N	COIL FIX 1 LF-5.0S T26 4R7J [4HEADS MODEL]
L696	EO-345881N	COIL FIX 1 EL0606SKI 101J [EM-K]
L697	EO-422474N	COIL FIX 1 LF-5.0S T26 6R8J [EK,EO,EOH,EOG]
L698	EO-345881N	COIL FIX 1 EL0606SKI 101J [EXCEPT EM-K]
MD1-A	BV-387610N	RF CONVERTER YAA21-0809G EA [EA]
MD1-B	BV-425222N	RF CONVER. YAA21-1001G G/K EDG [EDG]
MD1-C	BV-429839N	RF CONVERTER YAA21-1045H G EO [EO,EOH,EOG]
MD1-D	BV-429837N	RF CONVERTER YAA21-1046H I EK [EK]
MD1-E	BV-387611N	RF CONVERTER YAA21-0808G EV [EM]
MD1-F	BV-427963N	RF CONVER. YAA211031G G/I/K EDI [EM-K]
PH201	⚠ ET-422113N	PHOTO COUPLER PS2561-1-V
PJ101	EJ-432949N	PIN J T6582-ABBB YL.BK.4P [EA,EM,EM-K]
PJ102	EJ-429978N	SOCKET 035 0 9846 05 21P [EK,EO,G240/G440EDG,G240/G241/G245/ G445EOH(Y1)]
P101	EJ-429906N	PLUG TSK-B17P-A1 17P [EOG,G245/G445EDG,G240EOH(E), G254EOH(Y1),G255/G455EOH]
P201	⚠ EJ-416590N	SOCKET INLET CCT-2302-0371 2P
P401	EJ-422178N	PLUG TKC-G08P-A1 8P
P402	EJ-422176N	PLUG TKC-M07P-B1 7P
P601-A	EJ-432822N	SOCKET 52045-1845 18P [4HEADS MODEL]
P601-B	EJ-432820N	SOCKET 52045-1445 14P [2HEADS MODEL]
R201	⚠ ER-422189N	R CT P BGR3N 3W 4R7K [EXCEPT EA,EDG]
R206	ER-428396N	R OMF H S15 FS ERG2SH 2W 823J
R208	ER-422512N	R OMF H S15 FS ERG2SH 2W 151J
R210-A	ER-428386N	R OMF V T05 FS ERX1SE 1W R56J [EXCEPT EM,EM-K]
R210-B	ER-416671N	R OMF V T05 FS ERX1SE 1W R33J [EM,EM-K]
SW401	ES-426275N	SW MICRO ESE11SV1A
SW402	ES-428362N	SW TACT SKHHLV
SW403	ES-414593N	SW TACT SOR-142HS T05
SW404	ES-414593N	SW TACT SOR-142HS T05
SW405	ES-414593N	SW TACT SOR-142HS T05
SW406	ES-414593N	SW TACT SOR-142HS T05
SW407	ES-414593N	SW TACT SOR-142HS T05
SW408	ES-414593N	SW TACT SOR-142HS T05
SW409	ES-414593N	SW TACT SOR-142HS T05
TR1	ET-392746N1	TR 2SA933AS R,S T05 [EA,EM]
TR2	ET-364492N	TR DTC114TS T05 [EXCEPT EA,EM]
TR3	ET-392746N1	TR 2SA933AS R,S T05
TR4	ET-414816N	TR 2SC2668 Y T05
TR5	ET-373201N	TR DTC144TS T05 [EDG,EOH,EOG]
TR6	ET-392663N	TR 2SC1740S R,S T05 [EDG,EOH,EOG]
TR7	ET-428248N	TR C.2SA1037AK R,S T146T08E [EA,EK,EO,EM,EM-K]
TR8	ET-364023N	TR DTC114ES T05
TR9	ET-392746N1	TR 2SA933AS R,S T05
TR10	ET-392663N	TR 2SC1740S R,S T05
TR11	ET-392746N1	TR 2SA933AS R,S T05
TR12	ET-429897N	TR C.DTC144EKA T146T08E [EA,EK,EO,EM,G240/G440EDG, G240/G241/G245/G445EOH(Y1)]
TR13	ET-364291N	TR DTA144ES T05 [EK,EO,G240/G440EDG,G240/G241/G245/ G445EOH(Y1)]
TR14	ET-392746N1	TR 2SA933AS R,S T05 [EOG,G245/G445EDG,G240EOH(E), G254EOH(Y1),G255/G455EOH]
TR101	ET-392746N1	TR 2SA933AS R,S T05 [EXCEPT EOG,G245/G445EDG, G240EOH(E),G254EOH(Y1), G255/G455EOH]
TR199	ET-430868N	TR C.DTC114EKA T146T08E [EOG,G245/G445EDG,G240EOH(E), G254EOH(Y1),G255/G455EOH]
TR201-A	⚠ ET-428371N	TR 2SC4908 [EXCEPT EM,EM-K]
TR201-B	⚠ ET-427538N	TR FET 2SK2056 LBS2AKCAI [EM,EM-K]

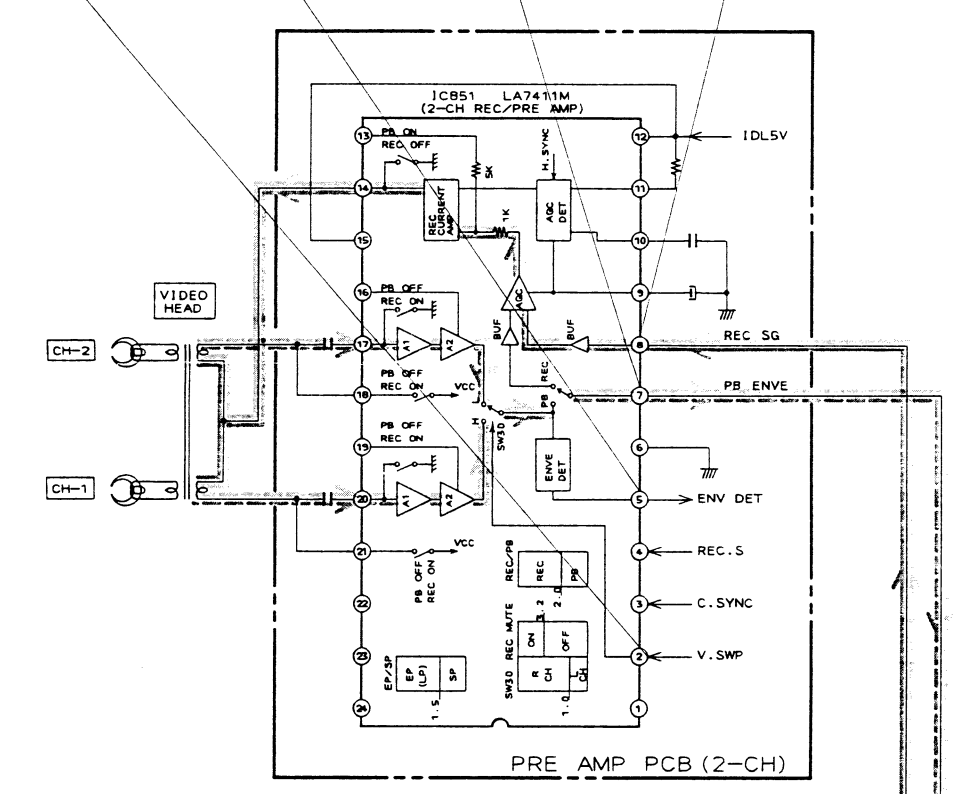
Ref. No.	Part No.	Description
TR202-A	⚠ET-422129N	TR 2SD2132 U,V T05 [EXCEPT EM,EM-K]
TR202-B	⚠ET-428407N	TR 2SC3616 M,L T05 [EM,EM-K]
TR203	ET-386784N	TR DTA143TS T05
TR204	ET-415140N	TR DTA115TS T05
TR205	ET-392663N	TR 2SC1740S R,S T05
TR207	ET-428373N	TR C.2SD2318 E,U,V FPTLT16E
TR208	ET-392663N	TR 2SC1740S R,S T05
TR211	ET-416697N	TR 2SD2396 J,K
TR212	ET-392663N	TR 2SC1740S R,S T05
TR213	ET-392663N	TR 2SC1740S R,S T05
TR214	ET-368786N	TR DTC143ZS T05
TR217	ET-428407N	TR 2SC3616 M,L T05 [EM,EM-K]
TR301	ET-419014N	TR 2SC1741S Q,R T05
TR302	ET-373201N	TR DTC144TS T05
TR303	ET-429899N	TR C.DTA144TKA T146T08E [EM-K]
TR304	ET-433071N	TR C.DTC144TKA T146T08E [EM-K]
TR351	ET-392663N	TR 2SC1740S R,S T05
TR401	ET-390009N	TR PHOTO PT493F
TR402	ET-390009N	TR PHOTO PT493F
TR403	ET-390010N	TR PHOTO PT4800
TR404	ET-390010N	TR PHOTO PT4800
TR405	ET-361961N	TR DTC144ES T05
TR406	ET-392746N1	TR 2SA933AS R,S T05
TR409	ET-428400N	TR C.DTC143EKA T146T08E
TR601	ET-366753N	TR DTA114ES T05
TR602	ET-392746N1	TR 2SA933AS R,S T05 [EOG,G245/G445EDG,G240EOH(E), G254EOH(Y1),G255/G455EOH]
TR603	ET-392663N	TR 2SC1740S R,S T05
TR604	ET-361961N	TR DTC144ES T05
TR606	ET-392663N	TR 2SC1740S R,S T05
TR607	ET-392663N	TR 2SC1740S R,S T05
TR608	ET-364291N	TR DTA144ES T05 [EXCEPT EA,EK]
TR610	ET-392663N	TR 2SC1740S R,S T05
TR611	ET-392663N	TR 2SC1740S R,S T05 [EM-K]
TR612	ET-366753N	TR DTA114ES T05
TR613	ET-392663N	TR 2SC1740S R,S T05
TR614	ET-361961N	TR DTC144ES T05 [EM-K]
TR652	ET-392663N	TR 2SC1740S R,S T05
TR653	ET-364291N	TR DTA144ES T05
TR654	ET-392663N	TR 2SC1740S R,S T05
TR657	ET-392663N	TR 2SC1740S R,S T05
TR672	ET-392663N	TR 2SC1740S R,S T05
TR673	ET-392663N	TR 2SC1740S R,S T05
TR674	ET-392663N	TR 2SC1740S R,S T05
TU1-A	EE-419189N	TV TUNER VTSH6AZ01 EA [EA]
TU1-B	EE-432823N	TV TUNER TEKE4-168A EOG [EDG,EOH,EOG]
TU1-C	EE-428336N	TV TUNER TEKB1-014A EK [G240/G245/G445EK]
TU1-D	EE-432827N	TV TUNER TEKE1-147A EO [EO,G246EK]
TU1-E	EE-405638N	TV TUNER VTSS6CZ EM [EM]
TU1-F	EE-428206N	TV TUNER TEKE1-115A EGN [EM-K]
T201-A	⚠BT-433085N	TRANS POW V1222EA-TM [EXCEPT EM,EM-K]
T201-B	⚠BT-432834N	TRANS POW V1222 EM [EM,EM-K]
X401	EI-425240N	OSC X'TAL APS1011A 16.000MHZ
X402	EI-431323N	OSC X'TAL C-002RX 32.768KHZ
X601-A	EI-405660N	OSC X'TAL HC-49U 4.433619MHZ [EXCEPT EM-K]
X601-B	EI-431006N	OSC X'TAL HC-49U GX 3.579545MH [EM-K]
X602	EI-405660N	OSC X'TAL HC-49U 4.433619MHZ [EM-K]

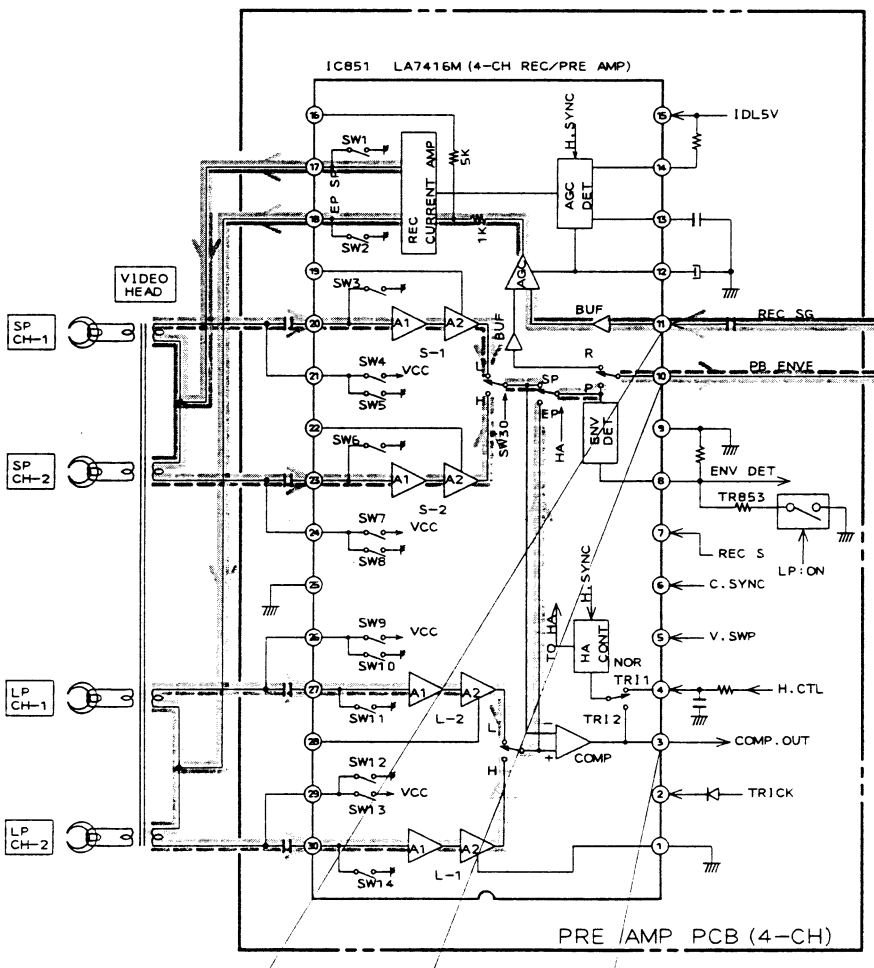
Ref. No.	Part No.	Description
1	SZ-426915N	HOLDER S/E SENSOR 2 (SG)
2	SZ-428508N	HOLDER PHOTO SENSOR (SG)
3	SZ-429350N	HOLDER FLD (SG)
4	SZ-429351N	HOLDER LED(1) (SG)

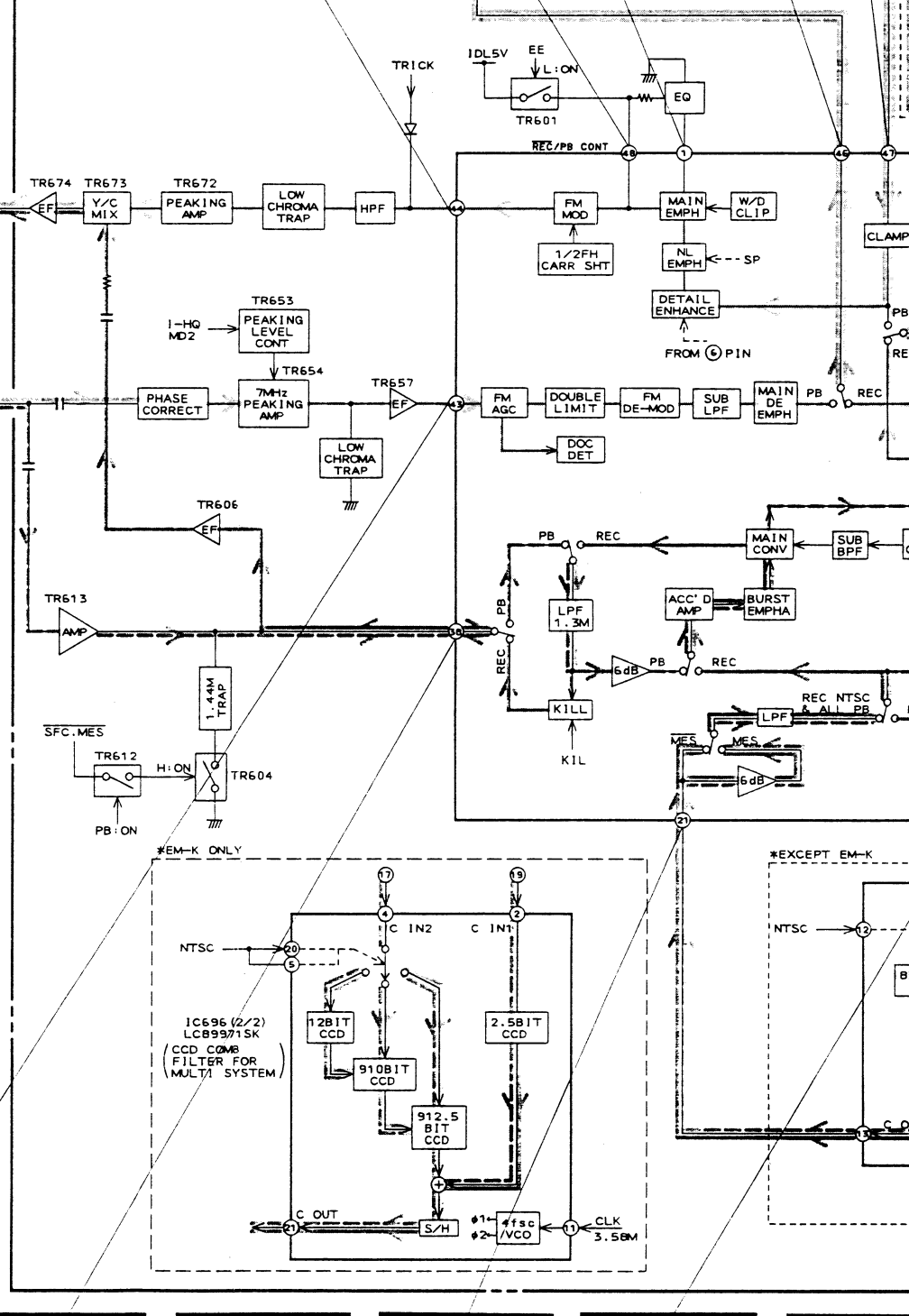
7. VIF-EDG BLK (EDG,EM-K)

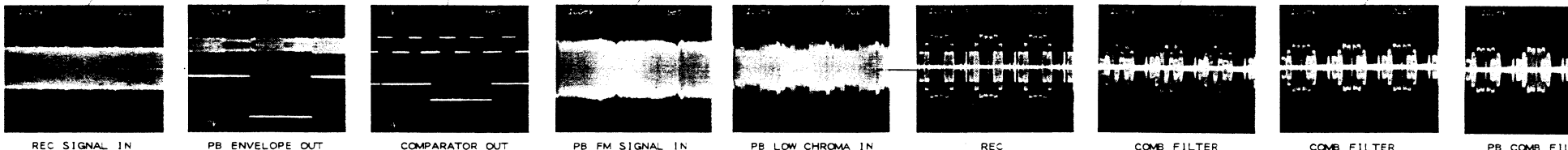
Ref. No.	Part No.	Description
FL1	EH-432627N	FILTER CE SAF38.9MZC70Z
FL2-A	EH-414623N	FILTER CE TPS6.5MB-TF21 T05 [EDG]
FL2-B	EH-416618N	FILTER CE TPS5.5MB-TF21 T05 [EM-K]
FL3	EH-368948N	FILTER CE TPS5.5MWA 5.5000MHZ
FL4	EH-428045N	FILTER CE TPWA01B 6.000MHZ [EM-K]
FL51	EH-433123N	FILTER CE SFSH6.5MCB-TF21 T05
FL52-A	EH-433121N	FILTER CE SFSH5.5MCB-TF21 T05 [EDG]
FL52-B	EH-433122N	FILTER CE SFSH6.0MCB-TF21 T05 [EM-K]
FL53	EH-433122N	FILTER CE SFSH6.0MCB-TF21 T05
FL54	EH-433121N	FILTER CE SFSH5.5MCB-TF21 T05 [EM-K]
IC1	EI-368809N	IC M51496P
L1-A	EO-427373N	COIL FIX 1 EL0405RA T05 1R8J [EDG]
L1-B	EO-403936N	COIL FIX 1 EL0405RA T05 1R2J [EM-K]
L5-A	EO-416716N	COIL FIX 1 EL0405RA T05 8R2J [EDG]
L5-B	EO-428123N	COIL FIX 1 EL0405RA T05 5R6J [EM-K]
L6-A	EO-410255N	COIL FIX 1 EL0405RA T05 470J [EDG]
L6-B	EO-408956N	COIL FIX 1 EL0405RA T05 390J [EM-K]
L51	EO-416716N	COIL FIX 1 EL0405RA T05 8R2J
L52	EO-408834N	COIL FIX 1 EL0405RA T05 221J
TR1	ET-432740N	TR C.2SC2480 T,S TXT08E
TR2	ET-416932N	TR C.2SB709A R,S TXT08E
TR3	ET-416933N	TR C.2SD601A R,S TXT08E
TR4	ET-416932N	TR C.2SB709A R,S TXT08E
TR51	ET-416933N	TR C.2SD601A R,S TXT08E
TR52	ET-416933N	TR C.2SD601A R,S TXT08E
VL2	EO-432611N	COIL TUN 1 F5001-098 SIF
VL3	EO-432607N	COIL TUN 1 F5001-094 AFT
VL4	EO-432601N	COIL TUN 1 F5001-089 LLD
VR1	EV-432752N	R S-FIX V T05 RH063LC 0.1W 223
X1	EI-368829N	OSC CE CSB512P

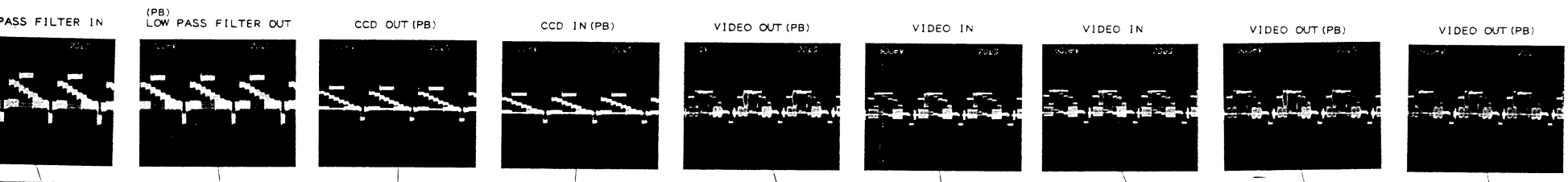

SWITCHING PULSE
ENVELOPE DETECT OUT (LOWER: V.SWP)
PB ENVELOPE OUT (LOWER: V.SWP)
REC SIGNAL IN
REC Y FM SIGNAL
REC MAIN EMPHASIS OUT
EQUALIZER (REC)
(PB) LOW PASS FILTER IN
(PB) LOW PASS FILTER OUT


IC851 LA7411M (2-CH REC/PRE AMP)
IDL5V
REC SG
PB ENVE
ENV DET
REC.S
C.SYNC
V.SWP
VIDEO HEAD
CH-2
CH-1
PRE AMP PCB (2-CH)


IC851 LA7416M (4-CH REC/PRE AMP)
IDL5V
REC SG
PB ENVE
ENV DET
REC S
C.SYNC
V.SWP
H.CTL
COMP.OUT
TRICK
VIDEO HEAD
SP CH-1
SP CH-2
LP CH-1
LP CH-2
PRE AMP PCB (4-CH)


*EM-K ONLY
IC696 (1/2)
LC89971SK
(CCD 1H DELAY LINE)
NTSC
908BIT CCD
6BIT CCD
TR607
TR610
4.43M TRAP
4.0M TRAP
3.58M TRAP
EXCEPT EA, EK
TR608
TR614
SEC.MES
3.58REC
EM-K ONLY
IDL5V
TRICK
EE
L:ON
TR601
EQ
REC/PB CONT
TR674
TR673
TR672
Y/C MIX
PEAKING AMP
LOW CHROMA TRAP
HPF
FM MOD
MAIN EMPH
W/D CLIP
CLAMP
1/2FH CARR SHT
NL EMPH
SP
DETAIL ENHANCE
FROM 6 PIN
TR653
I-HQ MD2
PEAKING LEVEL CONT
TR654
7MHz PEAKING AMP
PHASE CORRECT
TR657
FM AGC
DOUBLE LIMIT
FM DE-MOD
SUB LPF
MAIN DE EMPH
DOC DET
LOW CHROMA TRAP
TR606
TR613
AMP
1.44M TRAP
SEC.MES
TR612
H:ON
TR604
PB:ON
*EM-K ONLY
PB
REC
MAIN CONV
SUB BPF
ACC' D AMP
BURST EMPHA
LPF 1.3M
6dB
KILL
KIL
LPF
REC NTSC & ALL PB
MES
*EXCEPT EM-K
NTSC
C IN2
C IN1
IC696 (2/2)
LC89971SK
(CCD COMB FILTER FOR MULTI SYSTEM)
12BIT CCD
2.5BIT CCD
910BIT CCD
912.5 BIT CCD
C OUT
S/H
fsc /VCO
CLK 3.58M


REC SIGNAL IN (SP MODE)
PB ENVELOPE OUT (LOWER: V.SWP)
COMPARATOR OUT (CUE MODE) (LOWER: V.SWP)
PB FM SIGNAL IN
PB LOW CHROMA IN
REC LOW CHROMA OUT
COMB FILTER OUT (PB)
COMB FILTER IN (2) (PB)
PB COMB FIL IN (1)



VIDEO BLOCK DIAGRAM

No.4-1 V122251M A1

IC401 M37774MSH (SERVO/SYSTEM CONTROL MI-COM)

*EM-K ONLY
IC696 (1/2)
LC89971SK
(CCD 1H DELAY LINE)

TO PRE AMP PCB

REC. S
V. SWP
H. CTL
COMP OUT
ENV DET

DEC ONLY
C+. DATA
C+. CLK
DEC CTL
I²C. SDA
I²C. SDA

3.5BREC
NP
NTSC
TRICK
I-HQ MD1
I-HQ MD2
I-HQ PWM
EE
EE
C SYNC
C SYNC
CK
S. DET
3.5BREC
EM-K ONLY
C. ROT
VP
SP
S/L/E
SEC. MES
P/S/N
WITHOUT DEC
INT/EXT

TR610
EF
4.43M TRAP
4.0M TRAP
3.58M TRAP
EXCEPT EA, EK
TR608
L: ON
H: ON
SEC. MES
3.5BREC
EM-K ONLY
TR614
IDL 5V

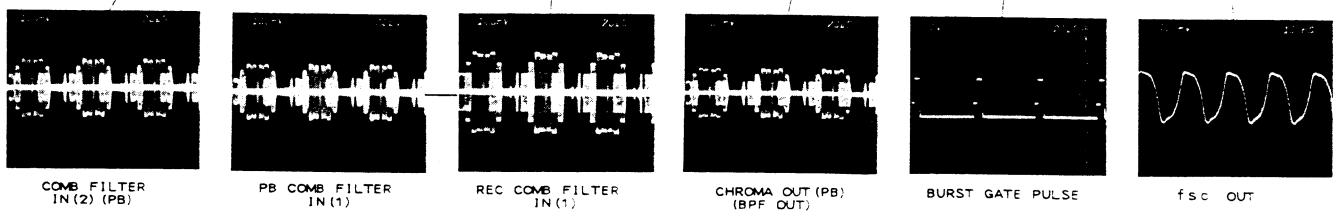
*EXCEPT EM-K
IC697 (1/2)
LC89975M
(CCD 1H DELAY LINE)
843BIT CCD
6BIT CCD
NTSC

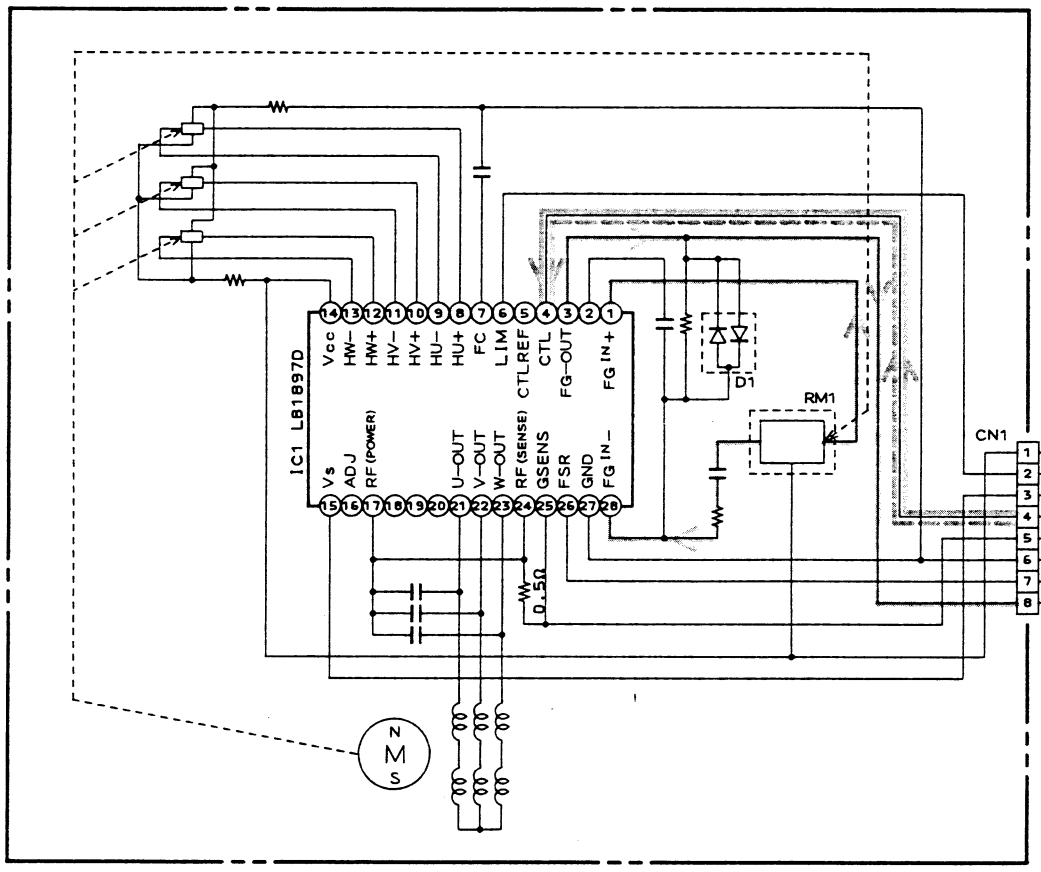
EQ
B CONT
MAIN EMPH
W/D CLIP
NL EMPH
SP
DETAIL ENHANCE
FROM ⑥ PIN
CLAMP
VCA
LPF
DOC
NOR
ATT
REC
PB
SP
DETAIL ENHANC
YNR
LPF
C. SYNC OUT
C. KILL
3.58 REC
C. ROT IN
VP IN
TAPE SPEED SELECT
VIDEO SYSTEM CONTROL
SP: L, LP: M, EP: H
PAL: L, MESECAM: M
NTSC: H
IC407 SDA5649X
(VPS/PDC DECODER)
SCL
SDA
CVBS
VPS/PDC MODELS ONLY
NL DE-EMPH
DOUBLE HP NOICAN
PICT CONT
Y/C MIX
3.5M LPF
LIM
K1
CORR
LIM
K2
6dB
SYNC SEPA
QV/QH INSRT & W/D CLIP
VIDEO AMP
VIDEO AGC
AGC DET
DELAY
1/2
FM DE-MOD
SUB LPF
MAIN DE EMPH
SUB BPF
SUB CONV
4PHASE SHIFTER
4.43M BPF
C. ROT
IC601
EM-K: LA7440M
EXCEPT EM-K:
LA7447BM
ACC' D AMP
BURST EMPHA
6dB
PB AMP BU. DE-EM KILLER
REC NTSC & ALL PB
REC NTSC
LPF
MES
INVERT
6dB
2fsc
NAP
NTSC
(NTSC→PAL)
FSC BPF
P/S DET
CHROMA N. CAN
7447 ONLY
7440 ONLY
BGP GEN
HALF H KILLER
EM-K ONLY
X602
4.43MHz
NAP/NOR
XO IN
XO OUT
X601
EXCEPT EM-K: 4.43MHz
EM-K: 3.58MHz
EDG. EM, EM-K ONLY
IC751 LA7356
(SECAM DETECT)
GATE
BGP
V. IN
fsc
DET OUT
S. DET
TR603
*EXCEPT EM-K
C IN2
C IN1
NTSC
858BIT CCD
1H
2.5BIT CCD
847BIT CCD
1H
C OUT
S/H
3fsc VCO
CLK 4.43M
*IC697 (2/2) LC89975M
1H/2H DELAY
(CCD COMB FILTER)
CLK 3.58M

LOGIC CONTROL
LATCH
SW1-4
IDL 12V
TR902
L: ON
TV MONITOR
TR904
6dB AMP
BUFF
SW4
(V-OUT)
(TV CONT)
(V-IN)
P901
DECODER
BUFF
SW1, 2
SW3
(V-IN)
(DEC-CTL)
TR903
6dB AMP
BUFF
(V-OUT)
P902
IC902 BA7630S
(VIDEO SELECTOR)
TR901
INV
CANAL PLUS PCB (DEC ONLY)
DEC ONLY
TR602
EF
WITHOUT DEC
EXCEPT EA, EM
PJ102
TR101
JS655
INT/EXT
EXT. V. IN
INT. V. IN
IC101
MM1111XF
V. OUT
V. IN
V. IN
V. OUT
PJ101
EA, EM ONLY
TR11
EF
IF1 V. OUT
VIF PCB
TU1
TUNER UNIT
ANT. IN
MD1
RF CONVERTER
V. OUT
A. OUT
WITHOUT DEC
PATTERN
TR14
DEC ONLY

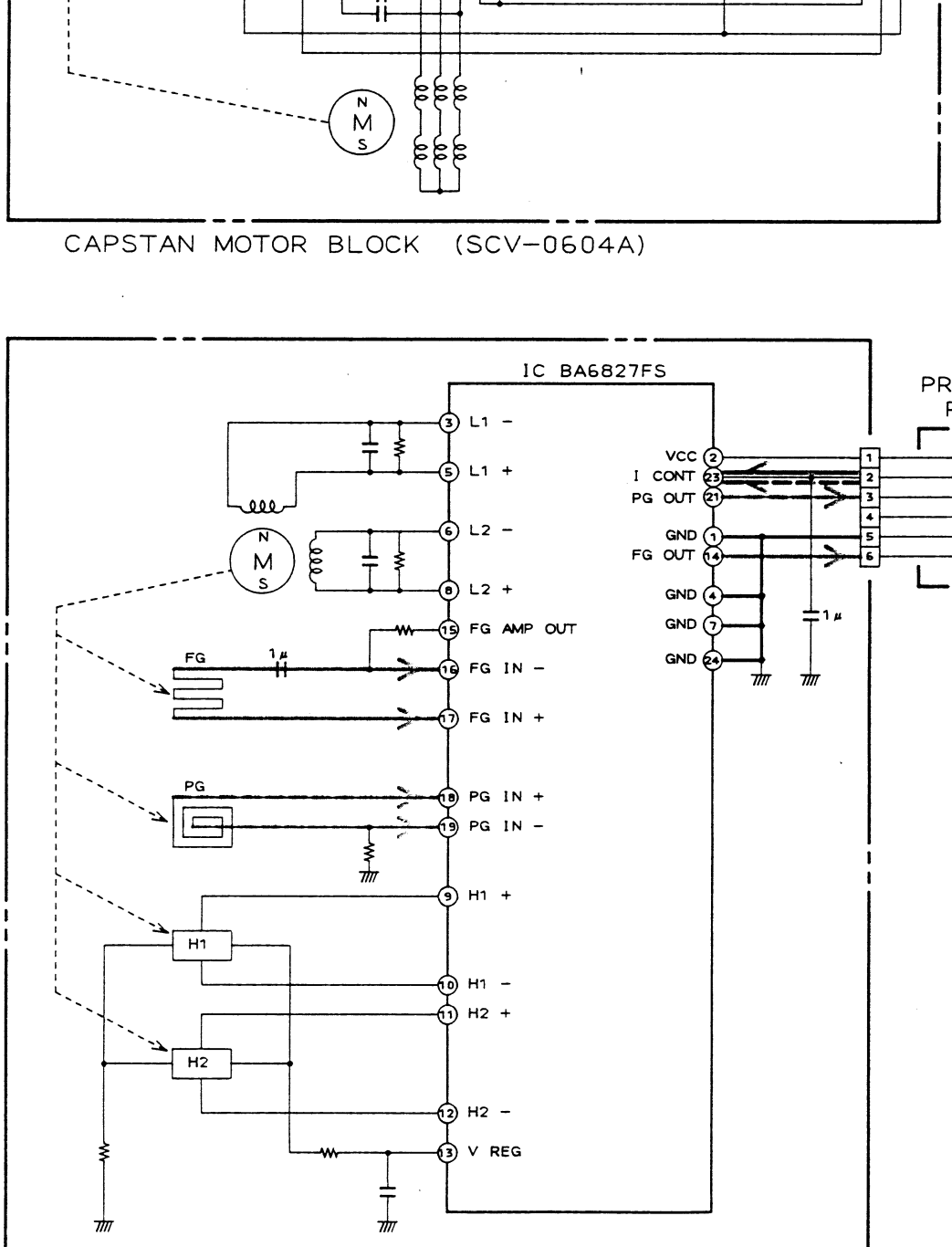
MAIN PCB

PB Y SIGNAL LINE
REC/EE Y SIGNAL LINE
PB CHROMA SIGNAL LINE
REC/EE CHROMA SIGNAL LINE




IC1 LB1897D
Vcc HW− HW+ HV− HV+ HU− HU+ FC LIM CTL REF CTL FG−OUT FG IN+
Vs ADJ RF (POWER) U−OUT V−OUT W−OUT RF (SENSE) GSENS FSR GND FG IN−
D1
RM1
0.5Ω
N
M
S

CAPSTAN MOTOR BLOCK (SCV-0604A)



DRUM MOTOR BLOCK (E20XL16)

PRE AMP PCB

CN1

P401

8	IDL5V	IDL5V
7	CM LIMIT	
6	CM 14V	CM 14V
5	CM CONT	
4	M. GND	M. GND
3	GND	GND
2	F/R	FWD/REV (DIRECTION CONTROL)
1	CM. FG	

IDL5V

IC402 (2/2)

LPF

TR405

(CM ON/OFF CONTROL)

H: ON

CM 14V

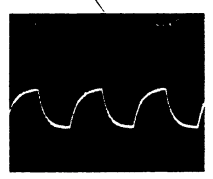
DM12V

IC402 (1/2)
NJM4558M

LPF

P601

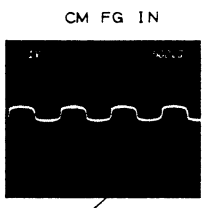
6	DM 12V	
4	DM CONT	
3	DM PG	
2	M GND	
1	M GND	M. GND
5	DM FG	

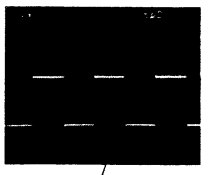


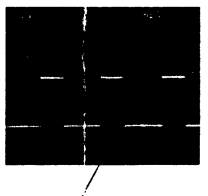
DM FG IN

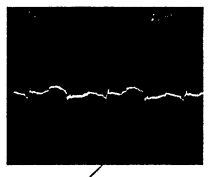
DM

NOTE: PHOTOGRAPHS EXCEPT [REC CTL OUT] WERE TAKEN DURING PB MODE.
EXCEPT [REC CTL OUT], PHOTOGRAPH' S SECOND LINE FROM THE BOTTOM IS DC 0V.


CM FG IN


CM ERROR OUT


DM ERROR OUT


ENV DETECT IN

IC401 M37774M5H
(SYSTEM CONTROL & SERVO MI-COM)

(DIRECTION CONTROL) 61 F/R
68 CM FG (SPEED)
(AUTO TRACKING CONT) 92 ENV DET

LPF 3 CM PWM
CM PHASE/SPEED ERROR DETECT
(PB) (PHASE)
REC /PB SW
78 CTL-
77 CTL+
WF302 5 6
CONTROL HEAD
(REC)
25Hz F.F

62 CM STOP

V.SYNC SEPA
93 C SYNC
FROM IC601 9 PIN (SYNC OUT)
8 C SYNC

LPF 4 DM PWM
V SWP 14 TO PRE AMP

66 DM PG (PHASE)
67 DM FG (SPEED)
DM PHASE/SPEED ERROR DETECT

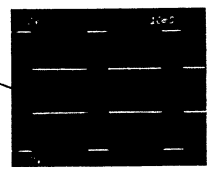
CTL AMP OUT 73
CLAMP R 72
CLAMP F 71
TR401 CTL

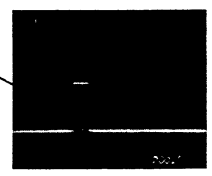
X IN 38
X OUT 39
XC IN 42
XC OUT 43
SYS SO 98
SYS SI 99
SYS CLK 100
SYS RDY 1

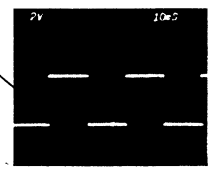
X401 16MHz
X402 32.768K

TR409
H:ON
CTL GAIN
CTL AMP GAIN CONTROL

VIDEO HEAD
IC851 LA7411M /LA7416M
PRE AMP
V SWP
ENV DET OUT
PRE AMP PCB


REC CTL OUT
(UPPER: CTL+
LOWER: CTL-)


C SYNC IN

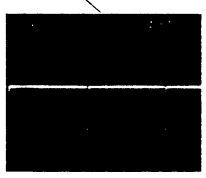

SWITCHING PULSE OUT

CTL AMP OUT

MAIN PCB

6 SCL
5 SDA
8 SYS CLK
9 SYS RDY
IC405 μPD16312GB
(OPE MI-COM)

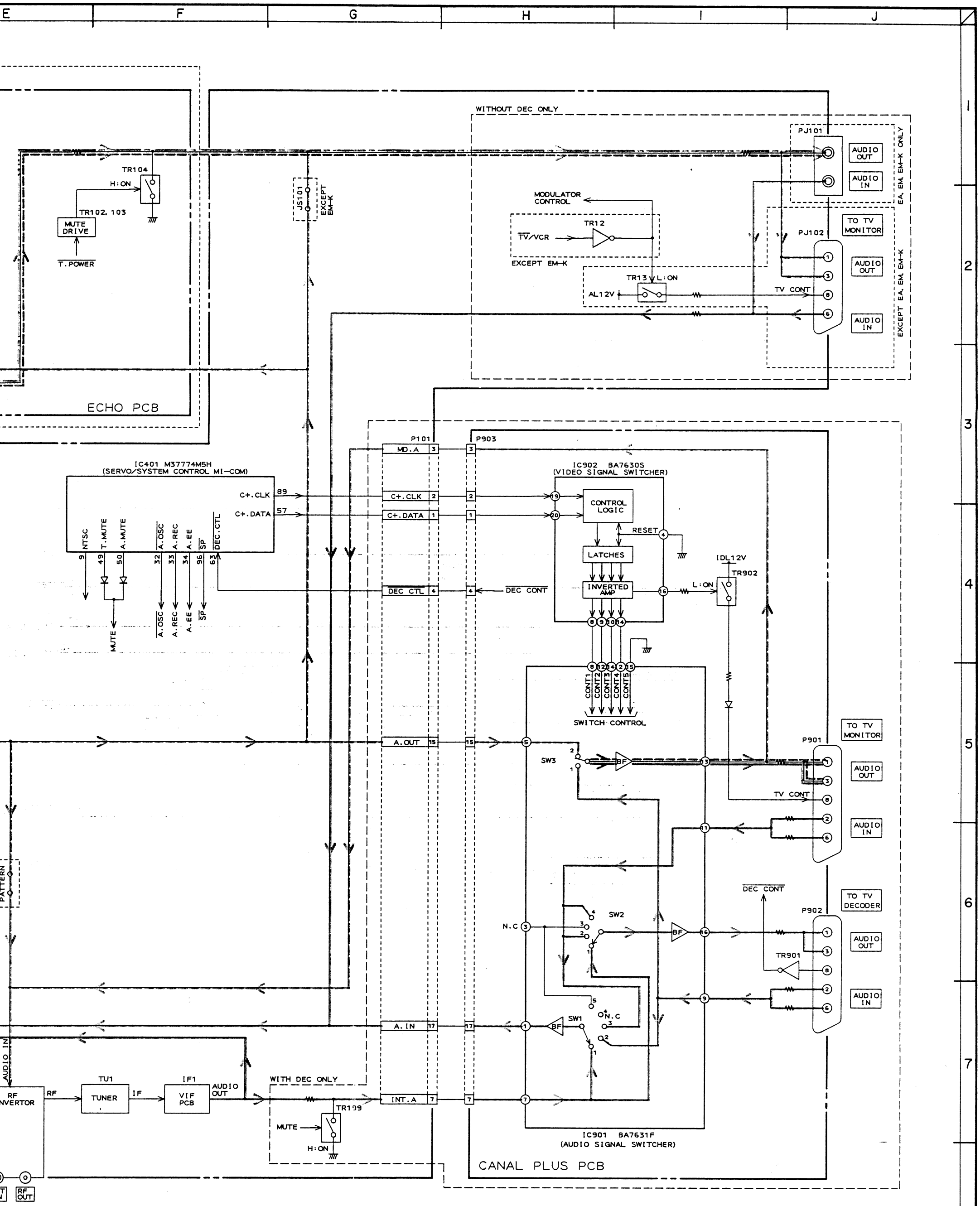
DM FG IN


DM PG IN

:CAPSTAN MOTOR SPEED CONTROL LINE
:CAPSTAN MOTOR PHASE CONTROL LINE
:DRUM MOTOR SPEED CONTROL LINE
:DRUM MOTOR PHASE CONTROL LINE

SERVO BLOCK DIAGRAM

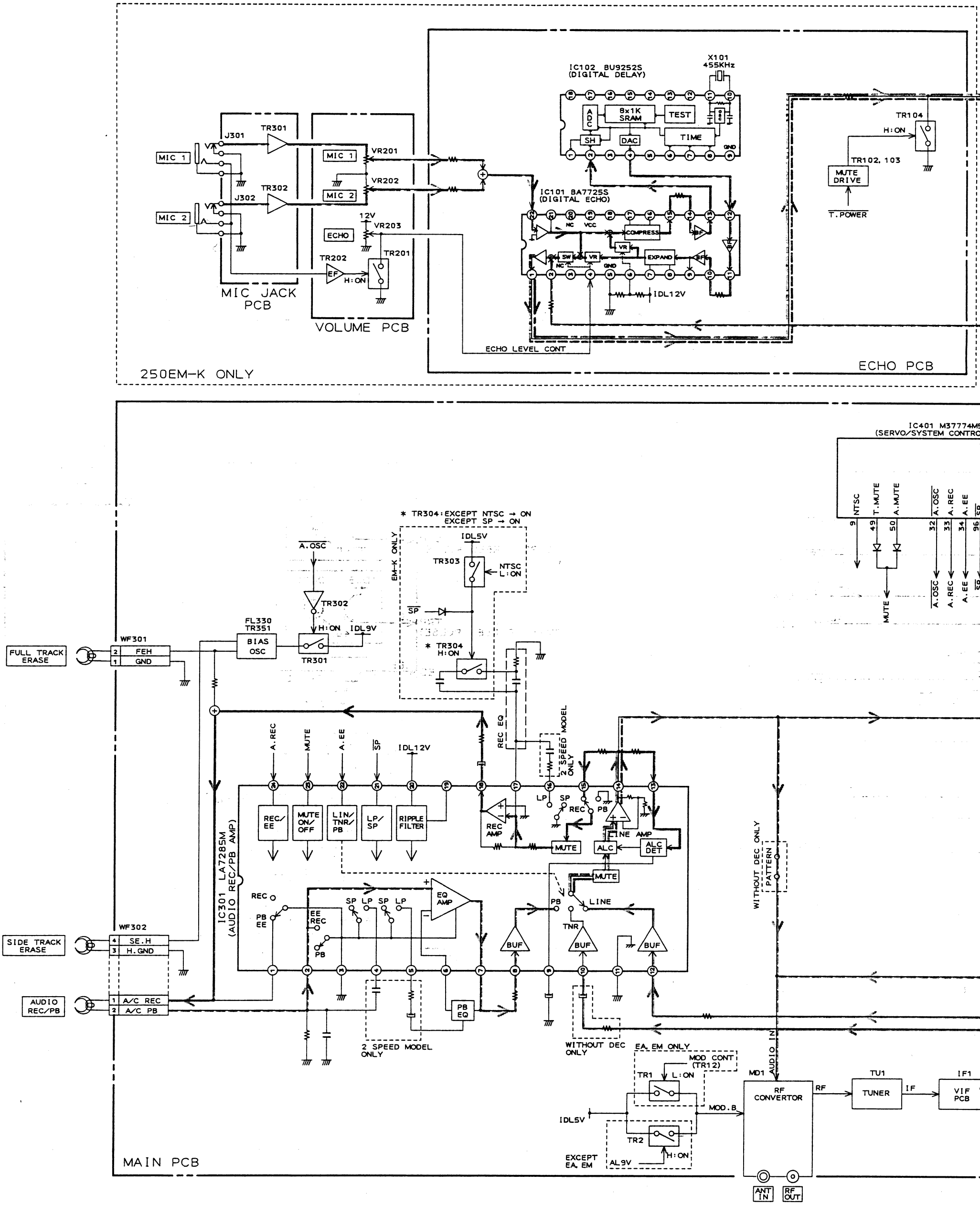
No.4-2 V122252M
A1



AUDIO BLOCK DIAGRAM

No.4-4 V122254M

A1


MIC JACK PCB
VOLUME PCB
ECHO PCB
250EM-K ONLY
MIC 1
MIC 2
J301
J302
TR301
TR302
VR201
VR202
VR203
12V
ECHO
TR201
TR202
EF
H:ON
IC102 BU9252S (DIGITAL DELAY)
X101 455KHz
ADC
8x1K SRAM
TEST
SH
DAC
TIME
GND
IC101 BA7725S (DIGITAL ECHO)
NC
VCC
COMPRESS
EXPAND
VR
SW
BF
IDL12V
ECHO LEVEL CONT
TR104
H:ON
TR102, 103
MUTE DRIVE
T.POWER
* TR304:EXCEPT NTSC → ON
EXCEPT SP → ON
EM-K ONLY
IDL5V
TR303
NTSC L:ON
SP
* TR304 H:ON
A.OSC
TR302
H:ON
IDL9V
FL330 TR351
BIAS OSC
TR301
WF301
FULL TRACK ERASE
2 FEH
1 GND
IC401 M37774M5
(SERVO/SYSTEM CONTRO
NTSC
T.MUTE
A.MUTE
A.OSC
A.REC
A.EE
MUTE
IC301 LA7285M (AUDIO REC/PB AMP)
A.REC
MUTE
A.EE
SP
IDL12V
REC EQ
2 SPEED MODEL ONLY
REC/ EE
MUTE ON/ OFF
LIN/ TNR/ PB
LP/ SP
RIPPLE FILTER
REC AMP
LP
SP
REC
PB
LINE AMP
MUTE
ALC
ALC DET
EQ AMP
EE REC
PB EE
PB EQ
BUF
LINE
TNR
WITHOUT DEC ONLY
PATTERN
WF302
SIDE TRACK ERASE
4 SE.H
3 H.GND
AUDIO REC/PB
1 A/C REC
2 A/C PB
2 SPEED MODEL ONLY
WITHOUT DEC ONLY
EA, EM ONLY
MOD CONT (TR12)
TR1
L:ON
MOD.B
IDL5V
TR2
H:ON
EXCEPT EA, EM
AL9V
MD1
AUDIO IN
RF CONVERTOR
RF
TU1
TUNER
IF
IF1
VIF PCB
ANT IN
RF OUT
MAIN PCB

MODE SWITCH TRUTH TABLE

OUTPUT \ MODE	EJECT	STOP (TAPE LOADED)	PAUSE/PLAY	PLAY	REVIEW	CUE	FF	REW	POWER OFF (WITH CASSETTE)
RSW4	H (5V)	H	H	H	H	H	L	L	H
RSW3	H (5V)	L	H	L	H	L	L	L	L
RSW2	L	H	H	H	L	H	H	H	L
RSW1	L	H	L	H	H	H	H	L	H

LPF
+32V
TR3
CURR CONT
+38V
(FROM POWER SUPPLY)
IC1 L5631
TR4

VIDEO CIRCUIT CONTROL

NP 7
NTSC 9
LTV/VCR 46
C.SYNC 8,93
EE 10
REC S 12
VP 13
V.SWP 14
C.ROT 15
T-HQ PWM 18
S/L/E 19
DEC INT/EXT 45
C+.DATA 57
DEC_CTL 63
T.POWER 60
S.DET 83
C-KILLER 84
I-HQ MD1 87
EM-K ONLY L3.5B_REC 88
INT/EXT (C+.CLK) 89
P/S/N 94
SEC.MES 95
SP 96
EE 97

2 TU PWM
42 XC IN
X402 32.768KHz
43 XC OUT
38 X IN
X401 16MHz
39 X OUT
56 BAND A
55 BAND B
90 AFT
54 AFT
47 I²C SDA
48 I²C SCL
214
21 SHORT
9.1K 9.1K AL 9V
58 VPS RDY
37 RESET
26.81 VCC
20 P.DOWN
XCEPT EM-K
TR12
46 TV/VCR

WITHOUT DEC
DEC ONLY
EM-K ONLY

IC401
M37774M5H
(SYSTEM CONTROL & SERVO MI-COM)

A.EE2 31
A.OSC 32
A.REC 33
SP 96
AUDIO CIRCUIT CONTROL

SYS RDY 1
SYS SO 98
SYS CLK 100
SYS SI 99
T.POWER 60
AL 9V or 12V CONTROL

T MUTE 49
A MUTE 50
MUTE → AUDIO CIRCUIT

LM.F 28
LM.R 29
TRQUP 27
L:ON
TR406
6.2V

IC403
LB1641
(MOTOR DRIVER)
Vcc 7
Vcc 8
LM.F 5
LM.R 6
Vref 4
LM+ 2
LM- 10
LM14V
FR401
LOADING MOTOR

RSW1~4 22~25
MODE SW MECHA. POSITION DETECT
LM/MS PCB

SRP 5
(SUPPLY REEL PULSE)
IDL5V D403
TR404

TRP 6
(TAKE UP REEL PULSE)
IDL5V D402
TR403

ES 85
TR402
D401
IDL5V
SS 86
TR401

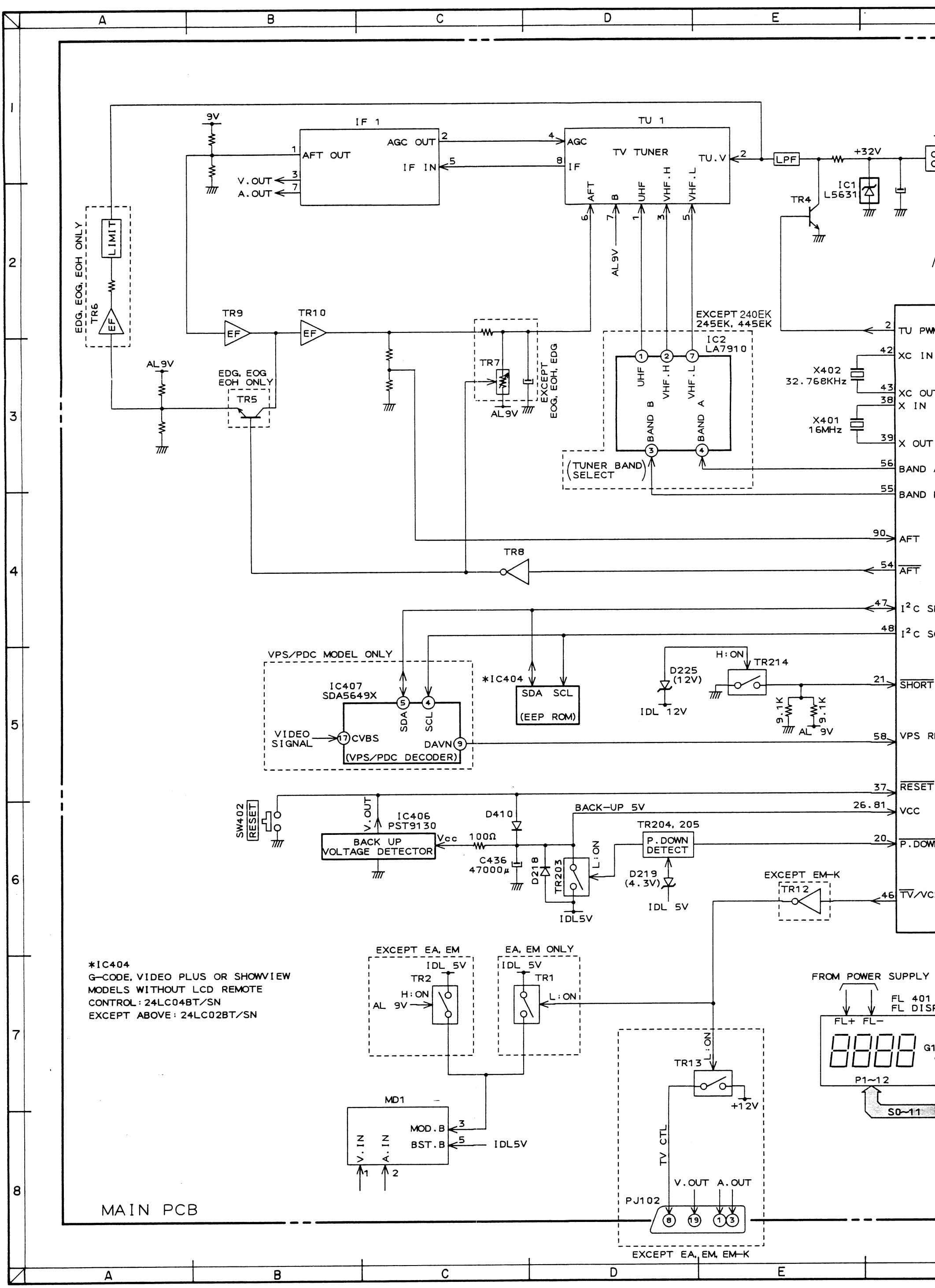
REC SAF 59
SW401
REC SAFETY SW
(ON→REC ENABLE)

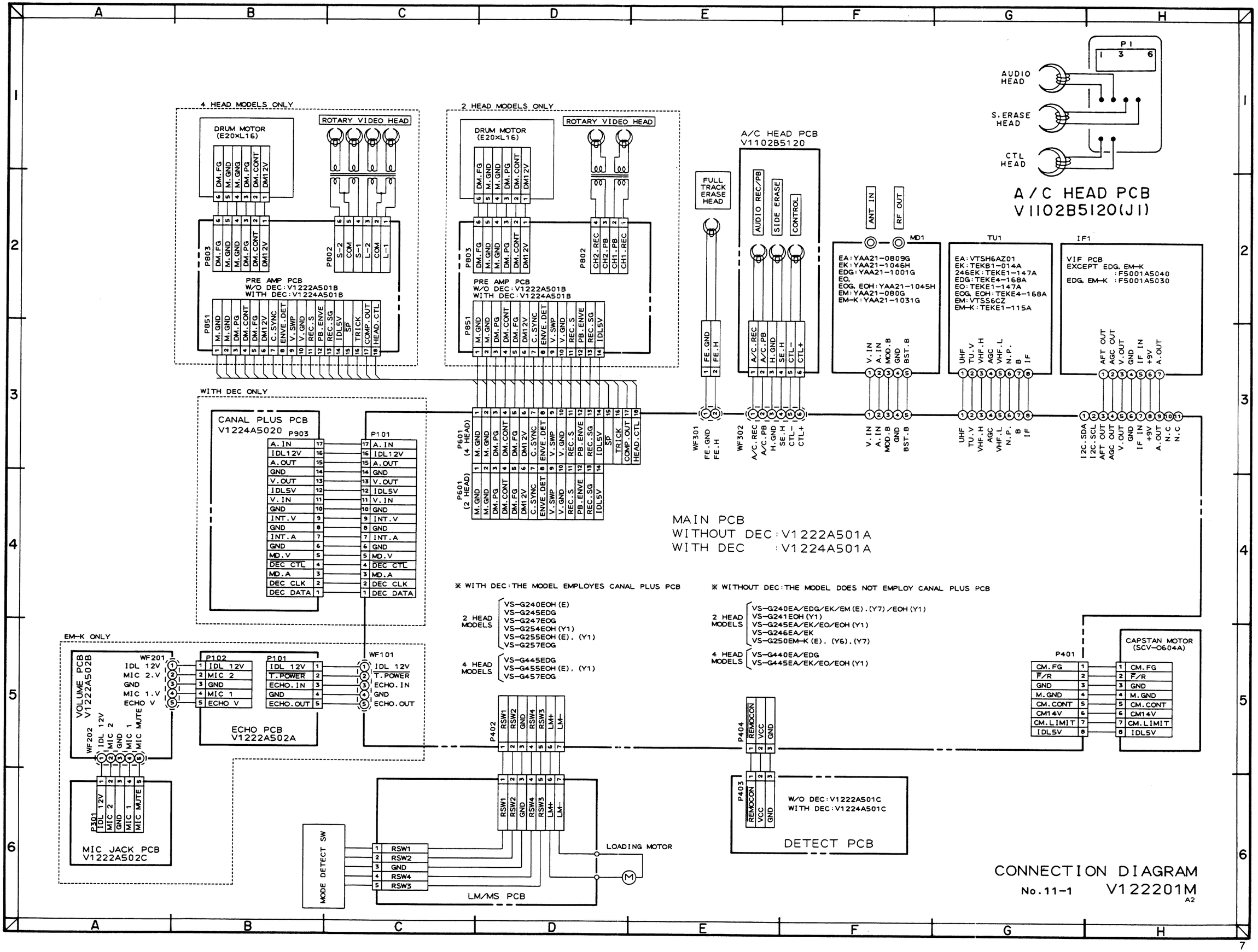
REMOCON 11
PH401
REMOCON SIG.DET
DETECT PCB

FROM POWER SUPPLY
FL 401
FL DISPLAY
FL+ FL-
G1~10
P1~12
28~37
T0~9
IC405
μPD16312GB
(OPERATION MI-COM)
S0~11
KEY1~4
15~26
10~13
S0~11
S0, 1
RDY SI CLK SO
(KEY MATRIX)

OPERATION & SYSCON
BLOCK DIAGRAM
No.4-3 V122253M
A1

5

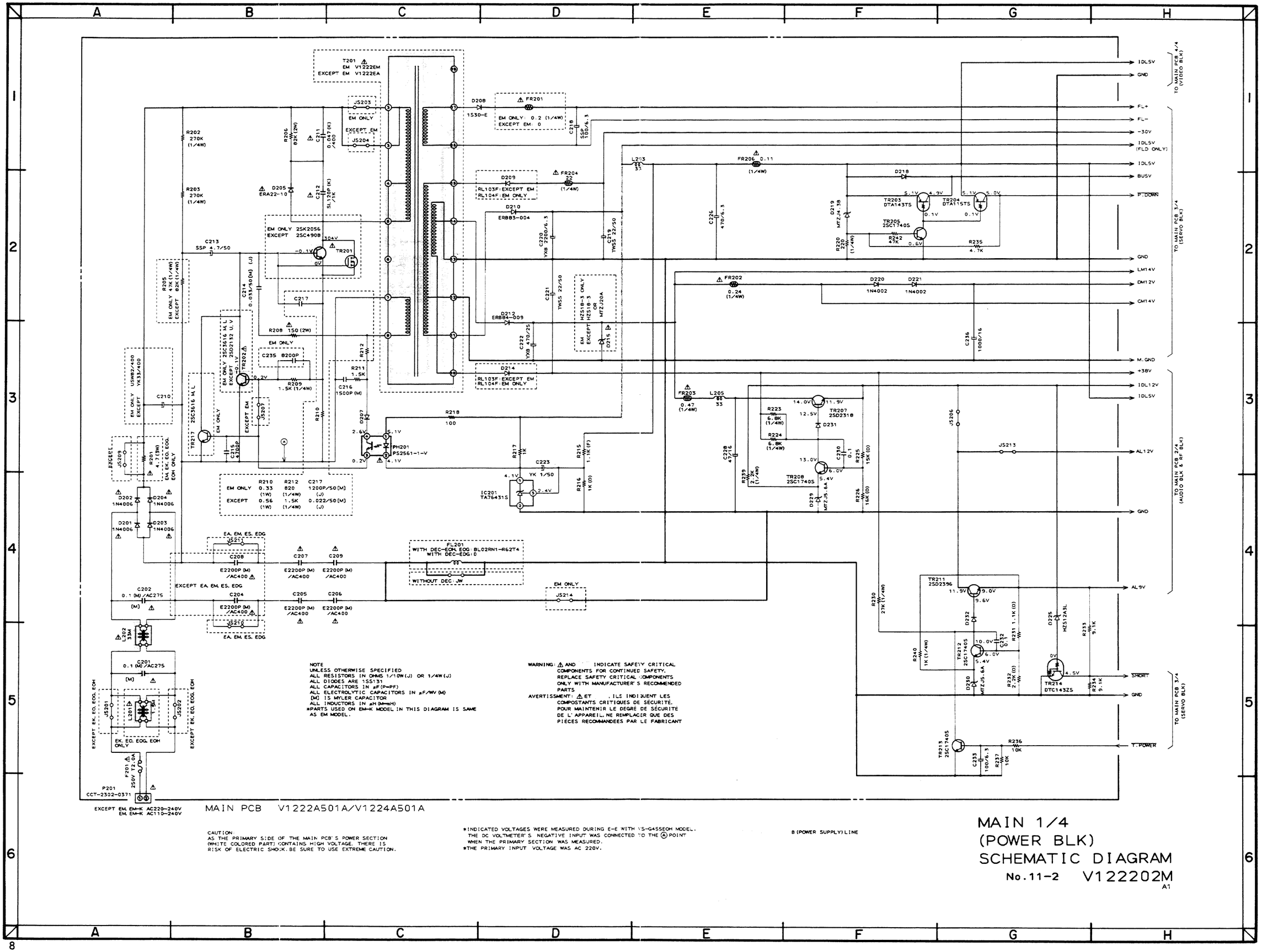

IF 1
AFT OUT
AGC OUT
IF IN
V.OUT
A.OUT
TU 1
TV TUNER
AGC
IF
TU.V
AFT
B
UHF
VHF.H
VHF.L
9V
AL9V
LPF
+32V
IC1
L5631
TR4
LIMIT
TR6
EF
EDG, EOG, EOH ONLY
TR9
TR10
TR7
EXCEPT EOG, EOH, EDG
TR5
EDG, EOG EOH ONLY
EXCEPT 240EK 245EK, 445EK
IC2
LA7910
BAND B
BAND A
(TUNER BAND SELECT)
X402
32.768KHz
X401
16MHz
TU PWM
XC IN
XC OUT
X IN
X OUT
BAND A
BAND B
AFT
TR8
I²C SI
I²C SC
VPS/PDC MODEL ONLY
IC407
SDA5649X
SDA
SCL
VIDEO SIGNAL
CVBS
DAVN
(VPS/PDC DECODER)
*IC404
SDA SCL
(EEP ROM)
H:ON
TR214
D225
(12V)
IDL 12V
9.1K
AL 9V
SHORT
VPS R
SW402
RESET
V.OUT
IC406
PST9130
BACK UP VOLTAGE DETECTOR
Vcc
100Ω
D410
C436
47000μ
D218
TR203
L:ON
BACK-UP 5V
TR204, 205
P.DOWN DETECT
D219
(4.3V)
IDL 5V
IDL5V
EXCEPT EM-K
TR12
TV/VC
RESET
VCC
P.DOW
FROM POWER SUPPLY
FL 401
FL DISP
FL+ FL-
P1~12
S0~11
EXCEPT EA, EM
EA, EM ONLY
TR2
TR1
H:ON
L:ON
AL 9V
MD1
MOD.B
BST.B
V.IN
A.IN
TR13
+12V
TV CTL
V.OUT A.OUT
PJ102
EXCEPT EA, EM, EM-K
*IC404
G-CODE, VIDEO PLUS OR SHOWVIEW
MODELS WITHOUT LCD REMOTE
CONTROL: 24LC04BT/SN
EXCEPT ABOVE: 24LC02BT/SN
MAIN PCB



CONNECTION DIAGRAM

No.11-1 V122201M

A2



NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/10W(J) OR 1/4W(J)
ALL DIODES ARE 1SS131
ALL CAPACITORS IN μF(P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV (M)
(M) IS MYLER CAPACITOR
ALL INDUCTORS IN μH (M=mH)
*PARTS USED ON EM-K MODEL IN THIS DIAGRAM IS SAME AS EM MODEL.

WARNING: ⚠ AND [illegible] INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS
AVERTISSEMENT: ⚠ ET [illegible], ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

MAIN PCB V1222A501A/V1224A501A

CAUTION
AS THE PRIMARY SIDE OF THE MAIN PCB'S POWER SECTION (WHITE COLORED PART) CONTAINS HIGH VOLTAGE. THERE IS RISK OF ELECTRIC SHOCK. BE SURE TO USE EXTREME CAUTION.

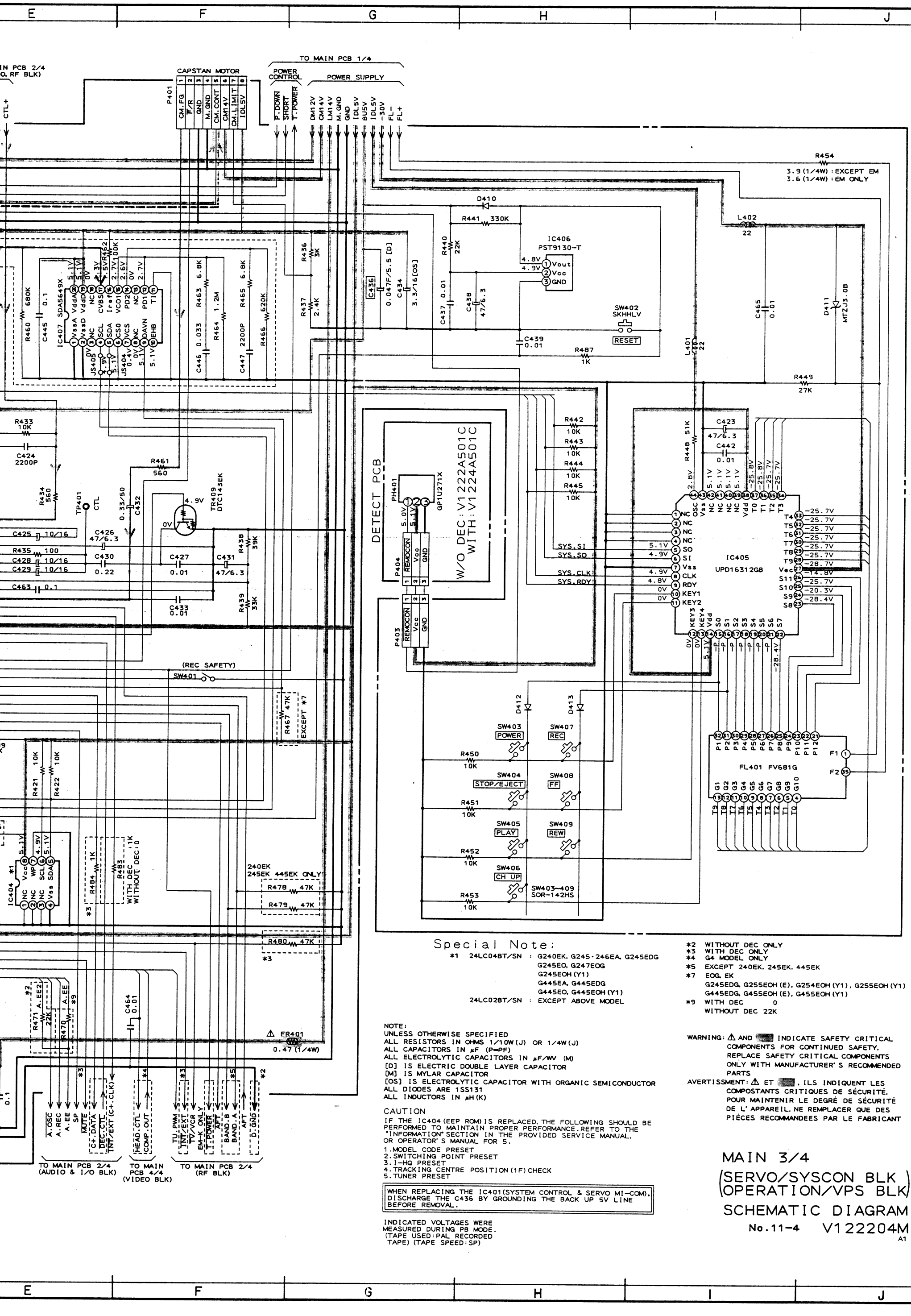
*INDICATED VOLTAGES WERE MEASURED DURING E-E WITH VS-G455EOH MODEL. THE DC VOLTMETER'S NEGATIVE INPUT WAS CONNECTED TO THE Ⓐ POINT WHEN THE PRIMARY SECTION WAS MEASURED.
*THE PRIMARY INPUT VOLTAGE WAS AC 220V.

B (POWER SUPPLY) LINE

MAIN 1/4 (POWER BLK) SCHEMATIC DIAGRAM

No.11-2 V122202M
A1

TO MAIN PCB 4/4 (VIDEO BLK)
EE
SP
SEC.MES
P/S/N
C.SYNC
ENV.DET
TRICK
NTSC
NP
3.58REC
*10
C.KILL
S.DET
V.IN
*10:EM-K ONLY
TO MAIN PCB 4/4 (VIDEO BLK)
DM.CONT
M.GND
DM.FG
DM.PG
DM12V
TO MAIN PCB 2/4 (AUDIO, RF BLK)
CTL-
CTL+
P401
CM.FG
NTSC
I-HQ MD1
EE
REC.S
VP
V.SWP
C.ROT
I-HQ.PWM
S/L/E
I-HQ MD2
TO MAIN PCB 4/4 (VIDEO BLK)
IC401
M37774M5H
EXCEPT
EK, EOG: 389GP NXGSYPS1
EOG: 391GP NXGSYGS1
EK : 390GP NXGSYPV1
( ) ··WITH DEC MODEL
SYS.RDY
TU.PWM
CM.PWM
DM.PWM
SRP
TRP
NP
C.SYNC
NTSC
EE
REMOCON
REC.S
VP
V.SWP
C.ROT
HEAD.CTL
COMP.OUT
I-HQ.PWM
S/L/E
P.DOWN
SHORT
RSW4
RSW3
RSW2
RSW1
Vcc
TRQUP
LM.F
LM.R
NC
SYS.CLK
SYS.SI
SYS.SO
EE
SP
SEC.MES
P/S/N
C.SYNC
ENV.DET
TRICK
AFT
INT/EXT (C+.CLK)
3.58REC (B.W/SEC)
I-HQ.MD1
SS
ES
CK
S.DET
Vref
Vcc
AMP.Vss
CTL.Vss
CTL-
CTL+
CTL+SWOUT
CTLAMP.IN
AMP.C
CTLAMP.OUT
CLAMPR
CLAMPF
AMP.Vref.IN
AMP.Vref.OUT
CM.FG
DM.FG
DM.PG
AMP.Vcc
CTL.GAIN
DEC.CTL
CM.STOP
F/R
T.POWER
REC.SAF
VPS.RDY
NC (C+. DATA)
BAND.A
BAND.B
AFT
NC (V.J)
A.EE2
A.OSC
A.REC
A.EE
NUA
NUA
RESET
X IN
X OUT
CLK.SEL
Vss
Xc in
Xc out
NC
INT/EXT
TV/VCR (NC)
I²C.SDA
I²C.SCL
T.MUTE
A.MUTE
I-HQ.MD2
V.SYNC.MON
IC407 SDA5649X
VddA
VssA
VddD
VssD
NC
NC
SCL
SDA
CVBS
CS0
Iref
VCO1
PD2
VCS
NC
NC
PD1
DAVN
TI
EHB
IC404
Vcc
WP
SCL
SDA
NC
NC
NC
Vss
IC403 LB1641
GND
LM+
P1
V ref
LM.F
LM.R
VCC1
VCC2
P2
LM-
TP401
CTL
TP402
LM+
LM-
TP403
TR401 PT493F
TR402 PT493F
TR403 PT4800
TR404 PT4800
TR406 2SA933S OR 2PA733
D401 GL528VTB
D402 GL4800
D403 GL4800
D404 MTZJ6.2C
X401 APS-1011A 16MHz
X402 C-002RX 32.768KHz
P402
RSW1
RSW2
GND
RSW4
RSW3
LM+
LM-
TO LM/MS PCB
MAIN PCB V1222A501A/V1224A501A
TO MAIN PCB 2/4 (AUDIO & I/O BLK)
TO MAIN PCB 4/4 (VIDEO BLK)
B (POWER SUPPLY) LINE
CAPSTAN MOTOR PHASE CONTROL LINE
CAPSTAN MOTOR SPEED CONTROL LINE
DRUM MOTOR PHASE CONTROL LINE
DRUM MOTOR SPEED CONTROL LINE
VIDEO SIGNAL LINE



Special Note:

*1 24LC04BT/SN : G240EK, G245·246EA, G245EDG
G245EO, G247EOG
G245EOH (Y1)
G445EA, G445EDG
G445EO, G445EOH (Y1)
24LC02BT/SN : EXCEPT ABOVE MODEL

*2 WITHOUT DEC ONLY
*3 WITH DEC ONLY
*4 G4 MODEL ONLY
*5 EXCEPT 240EK, 245EK, 445EK
*7 EOG, EK
G245EDG, G255EOH (E), G254EOH (Y1), G255EOH (Y1)
G445EDG, G455EOH (E), G455EOH (Y1)
*9 WITH DEC 0
WITHOUT DEC 22K

NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/10W (J) OR 1/4W (J)
ALL CAPACITORS IN μF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV (M)
[D] IS ELECTRIC DOUBLE LAYER CAPACITOR
[M] IS MYLAR CAPACITOR
[OS] IS ELECTROLYTIC CAPACITOR WITH ORGANIC SEMICONDUCTOR
ALL DIODES ARE 1SS131
ALL INDUCTORS IN μH (K)

CAUTION
IF THE IC404 (EEP ROM) IS REPLACED, THE FOLLOWING SHOULD BE PERFORMED TO MAINTAIN PROPER PERFORMANCE. REFER TO THE "INFORMATION" SECTION IN THE PROVIDED SERVICE MANUAL, OR OPERATOR'S MANUAL FOR 5.
1. MODEL CODE PRESET
2. SWITCHING POINT PRESET
3. I-HQ PRESET
4. TRACKING CENTRE POSITION (1F) CHECK
5. TUNER PRESET

WHEN REPLACING THE IC401 (SYSTEM CONTROL & SERVO MI-COM), DISCHARGE THE C436 BY GROUNDING THE BACK UP 5V LINE BEFORE REMOVAL.

INDICATED VOLTAGES WERE MEASURED DURING PB MODE.
(TAPE USED: PAL RECORDED TAPE) (TAPE SPEED: SP)

WARNING: ⚠ AND ▬ INDICATE SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY. REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSMENT: ⚠ ET ▬, ILS INDIQUENT LES COMPOSTANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

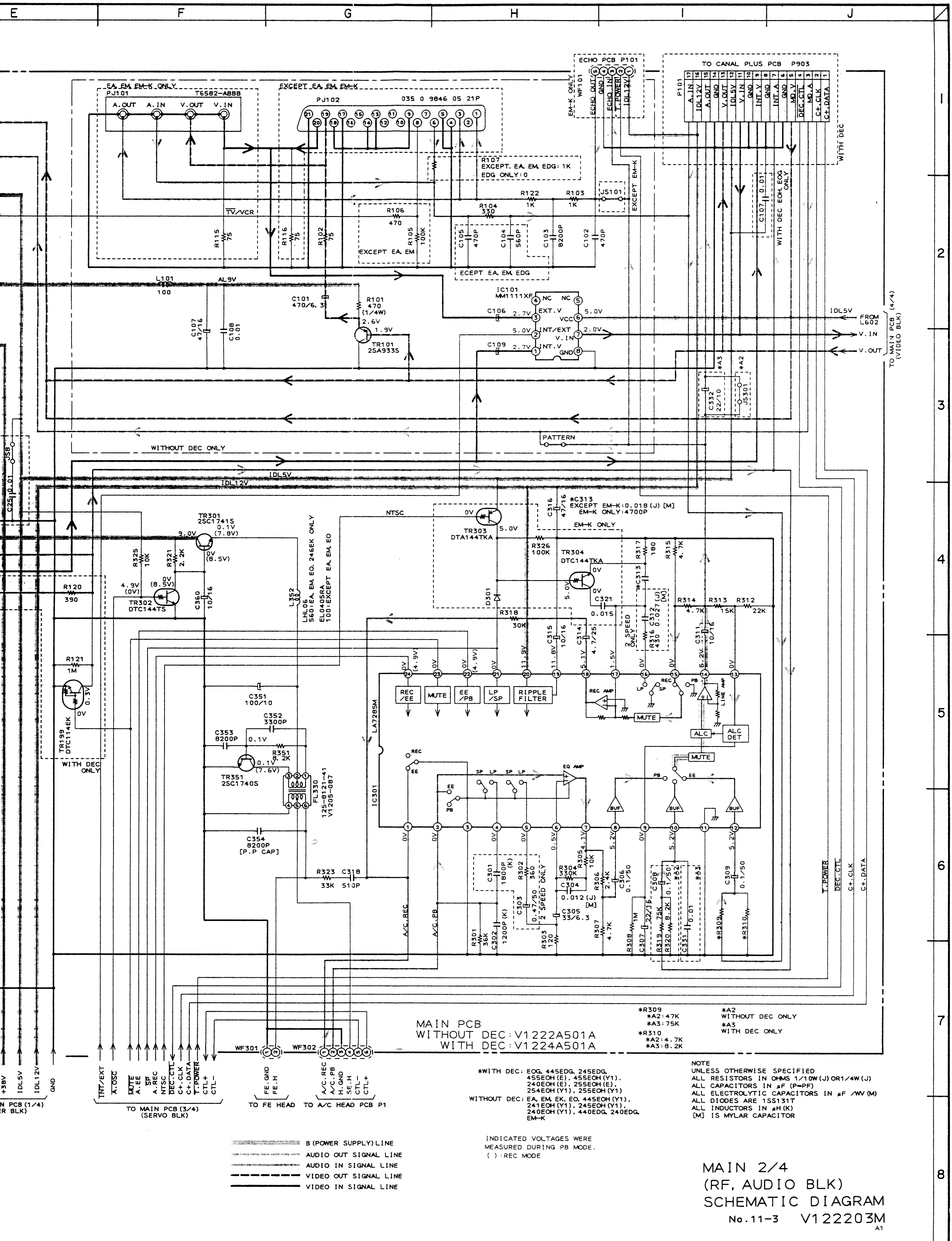
MAIN 3/4
(SERVO/SYSCON BLK / OPERATION/VPS BLK)
SCHEMATIC DIAGRAM

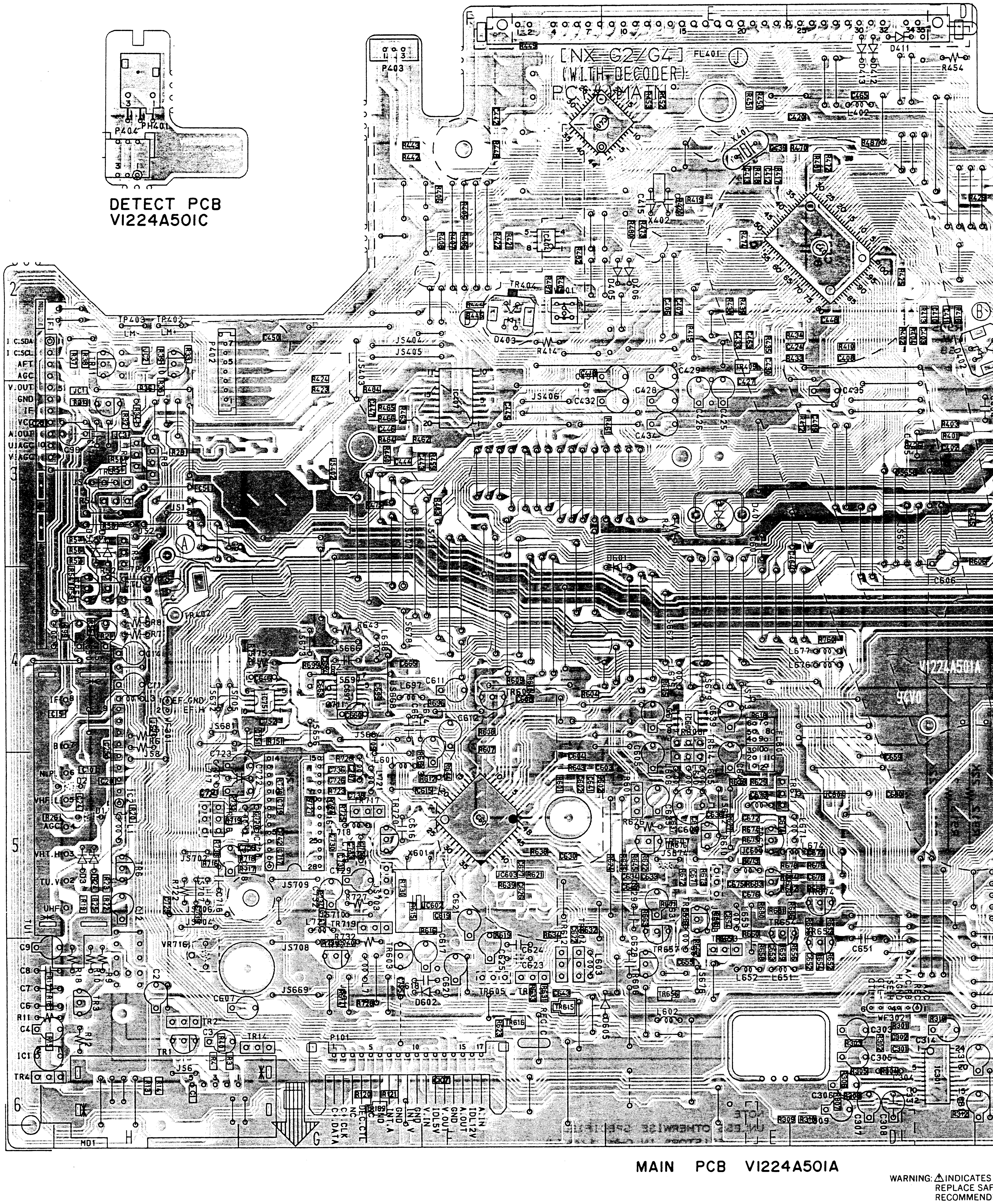
No.11-4 V122204M
A1

	*TU1	*MD1	*IF1
EA	VTSH6AZ01	YAA21-0809G	NOR-EA
EK	TEKB1-014A	YAA21-1046H	NOR-EK
246EK	TEKE1-147A	YAA21-1046H	NOR-ES
EDG	TEKE4-168A	YAA21-1001G	NOR-EDG
EO	TEKE1-147A	YAA21-1045H	NOR-EOG
EOG, EOH	TEKE4-168A	YAA21-1045H	NOR-EOG
EM	VTSS6CZ	YAA21-0808G	NOR-EM
EM-K	TEKE1-115A	YAA21-1031G	NOR-EM-K

	EDG, EOG, EOH	EA, EK, (246EK), EO, EM, EM-K
R12	22K	22K
R18	22K	22K
R20	240K	–
R21	330K	–
R23	10K	–
R24	390K	–
R25	1.5M	–
R31	390K	390K
R32	330K	330K

	EDG, EOG, EOH	EA	EK, EM	EO, (246EK)	EM-K
C12	10/16	–	–	–	–
D4	MTZJ-15C	–	–	–	–
L2	–	1.0μH	0.68μH	–	0.47μH


EA, EM, EM-K ONLY
PJ101
T6582-A888
A.OUT
A.IN
V.OUT
V.IN
EXCEPT EA, EM, EM-K
PJ102
035 0 9846 05 21P
ECHO PCB P101
EM-K ONLY
WF101
ECHO OUT
GND
ECHO IN
T.POWER
IDL12V
TO CANAL PLUS PCB P903
P101
A.IN
IDL12V
A.OUT
GND
V.OUT
IDL5V
V.IN
GND
INT.V
GND
INT.A
GND
MD.V
DEC.CTL
MD.A
C+.CLK
C+.DATA
WITH DEC
R107
EXCEPT, EA, EM, EDG: 1K
EDG ONLY: 0
R122
1K
R103
1K
JS101
EXCEPT EM-K
TV/VCR
R106
470
R104
330
R115
75
R116
75
R102
75
R105
100K
EXCEPT EA, EM
C105
470P
C104
560P
C103
8200P
C102
470P
ECEPT EA, EM, EDG
C107
0.01
WITH DEC EOH, EDG ONLY
L101
100
AL9V
C101
470/6.3
R101
470
(1/4W)
2.6V
1.9V
TR101
2SA933S
C107
47/16
C108
0.01
IC101
MM1111XF
NC
NC
EXT.V
VCC
INT/EXT
V.IN
INT.V
GND
C106
2.7V
5.0V
2.0V
C109
2.7V
IDL5V
FROM L602
V.IN
V.OUT
TO MAIN PCB (4/4) (VIDEO BLK)
*A3
*A2
C332
22/10
JS301
PATTERN
WITHOUT DEC ONLY
IDL5V
IDL12V
JS8
C25
0.01
TR301
2SC1741S
0.1V
(7.8V)
9.0V
0V
(8.5V)
R325
10K
R321
2.2K
4.9V
(0V)
0V
(8.5V)
TR302
DTC144TS
C360
10/16
R120
390
L352
LHL06
560:EA, EM, EO, 246EK ONLY
EL0405RA
100:EXCEPT EA, EM, EO
NTSC
TR303
DTA144TKA
0V
5.0V
R326
100K
TR304
DTC144TKA
0V
0V
C316
47/16
*C313
EXCEPT EM-K:0.018(J) [M]
EM-K ONLY:4700P
EM-K ONLY
R317
180
R315
4.7K
*C313
D301
5.0V
C321
0.015
R318
30K
2 SPEED ONLY
R316
430
C312
0.027(J) [M]
R314
4.7K
R313
15K
R312
22K
C311
10/16
C315
10/16
C314
4.7/25
R121
1M
0.3V
0V
TR199
DTC114EK
WITH DEC ONLY
C351
100/10
C352
3300P
C353
8200P
0.1V
R351
9.2K
0.1V
(7.6V)
TR351
2SC1740S
FL330
125-8121-41
V1205-087
C354
8200P
[P.P CAP]
R323
33K
C318
510P
LA7285M
REC
/EE
MUTE
EE
/PB
LP
/SP
RIPPLE FILTER
REC AMP
REC
PB
LP
SP
LINE AMP
MUTE
ALC
ALC DET
IC301
REC
EE
SP LP SP LP
EQ AMP
EE
PB
MUTE
PB
EE
BUF
BUF
BUF
C301
1800P (K)
C302
1200P (K)
R301
36K
R302
360
C303
0.47/50
2 SPEED ONLY
R303
120
C304
0.012(J) [M]
C305
33/6.3
R305
10K
R306
2.4K
R307
4.7K
C306
0.1/50
R308
1M
C307
22/16
C308
0.1/50
R319
75K
R320
8.2K
C331
0.01
*R308
*R310
C309
0.1/50
T.POWER
DEC.CTL
C+.CLK
C+.DATA
A/C.REC
A/C.PB
WF301
WF302
TNT/EXT
A.OSC
MUTE
A.EE
SP
A.REC
NTSC
DEC.CTL
C+.CLK
C+.DATA
T.POWER
CTL+
CTL-
FE.GND
FE.H
A/C.REC
A/C.PB
H.GND
SE.H
CTL-
CTL+
TO MAIN PCB (3/4) (SERVO BLK)
TO FE HEAD
TO A/C HEAD PCB P1
*R309
*A2: 47K
*A3: 75K
*R310
*A2: 4.7K
*A3: 8.2K
*A2
WITHOUT DEC ONLY
*A3
WITH DEC ONLY
MAIN PCB
WITHOUT DEC: V1222A501A
WITH DEC: V1224A501A
*WITH DEC: EOG, 445EDG, 245EDG, 455EOH(E), 455EOH(Y1), 240EOH(E), 255EOH(E), 254EOH(Y1), 255EOH(Y1)
WITHOUT DEC: EA, EM, EK, EO, 445EOH(Y1), 241EOH(Y1), 245EOH(Y1), 240EOH(Y1), 440EDG, 240EDG, EM-K
NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/10W(J) OR 1/4W(J)
ALL CAPACITORS IN µF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN µF /WV (M)
ALL DIODES ARE 1SS131T
ALL INDUCTORS IN µH (K)
[M] IS MYLAR CAPACITOR
B (POWER SUPPLY) LINE
AUDIO OUT SIGNAL LINE
AUDIO IN SIGNAL LINE
VIDEO OUT SIGNAL LINE
VIDEO IN SIGNAL LINE
INDICATED VOLTAGES WERE MEASURED DURING PB MODE.
( ): REC MODE
MAIN 2/4
(RF, AUDIO BLK)
SCHEMATIC DIAGRAM
No.11-3 V122203M
A1



DETECT PCB
V1224A501C

MAIN PCB V1224A501A

WARNING: ⚠INDICATES
REPLACE SAF
RECOMMEND

AVERTISSEMENT: ⚠IL IN
POUR MAINTE
NE REMPLAC

NOTE : PARTS
REFER
PARTS I

PRINCIPAL PARTS LOCATION

ICs

IC1	H6
IC2	H4,5
IC201	B3
IC301	D6
IC401	D2
IC402	C3
IC403	C1,2
IC404	F2
IC405	E,F1
IC406	C1
IC407	F3
IC601	F5
IC602	E4
IC697	G4
IC716	G5
IC751	G4

TRANSISTORs

TR1	H6
TR2	H6
TR3	H6
TR4	H6
TR5	H3
TR6	H5
TR8	H3
TR9	H3
TR10	H2
TR11	H2
TR14	G6
TR50	H3
TR51	H4
TR52	H4
TR53	H3
TR54	H3
TR201	A4
TR202	A5
TR203	B2
TR204	B2
TR205	C2
TR207	A2
TR208	A2
TR210	B2
TR211	B2
TR212	B3
TR213	B2
TR214	B3
TR215	B2
TR216	B2
TR217	A5
TR301	B5
TR302	B,C5
TR303	C5
TR304	C6
TR351	B6
TR405	C3
TR406	C2
TR409	E2
TR601	E5
TR602	F4
TR603	G6
TR604	F6
TR605	F6
TR606	E6
TR607	E5
TR608	E4
TR610	E5
TR612	F6
TR613	F6
TR614	E5
TR615	F6
TR616	F6
TR652	D6
TR653	E6
TR654	E5,6
TR655	E5
TR656	E6
TR657	E5,6
TR671	E5
TR672	E5
TR673	E5
TR674	D5
TR676	E5
TR716	H5
TR717	G5
TR719	G5
TR720	G5
TR721	G6

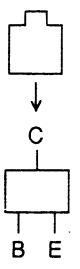
CONNECTORs

P101	F,G6
P201	A,B6
P401	B4
P402	G2,3
P403	G1
P601	C6

WIREs

WF301	H4
WF302	D6

SINGLE CHIP TRANSISTOR



501A

WARNING: ⚠ INDICATES SAFETY CRITICAL COMPONENTS FOR CONTINUED SAFETY, REPLACE SAFETY CRITICAL COMPONENTS ONLY WITH MANUFACTURER'S RECOMMENDED PARTS

AVERTISSEMENT: ⚠ IL INDIQUE LES COMPOSANTS CRITIQUES DE SÉCURITÉ. POUR MAINTENIR LE DEGRÉ DE SÉCURITÉ DE L'APPAREIL, NE REMPLACER QUE DES PIÈCES RECOMMANDEES PAR LE FABRICANT

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.

CAUTION:
As the primary side of the MAIN PCB's power section (white colored part) contains high voltage, there is risk of electric shock. be sure to use extreme caution.

TO DECODER

P902 (BLUE)

R901 680

R902 3K

R903 3K

C901 100P

C902 6800P

C903 680P

C904 100P

C905 100P

R904 75

R906 680

C906 100P

R940 100K

C907

R905 68

C918 1/50

IC901 BA7631F

C919 47/6.3

C920 0.01

C912 0.01

C913 47/16

C914 1/50

C917 1/50

C916 1/50

C915 1/50

L901 100

L902 100

L903 100

R911 10K

R912 22K

R913 22K

R914 22K

C927 0.01

C926 47/16

5.1V

0V

TR901
DTC144ES
(47K–47K)

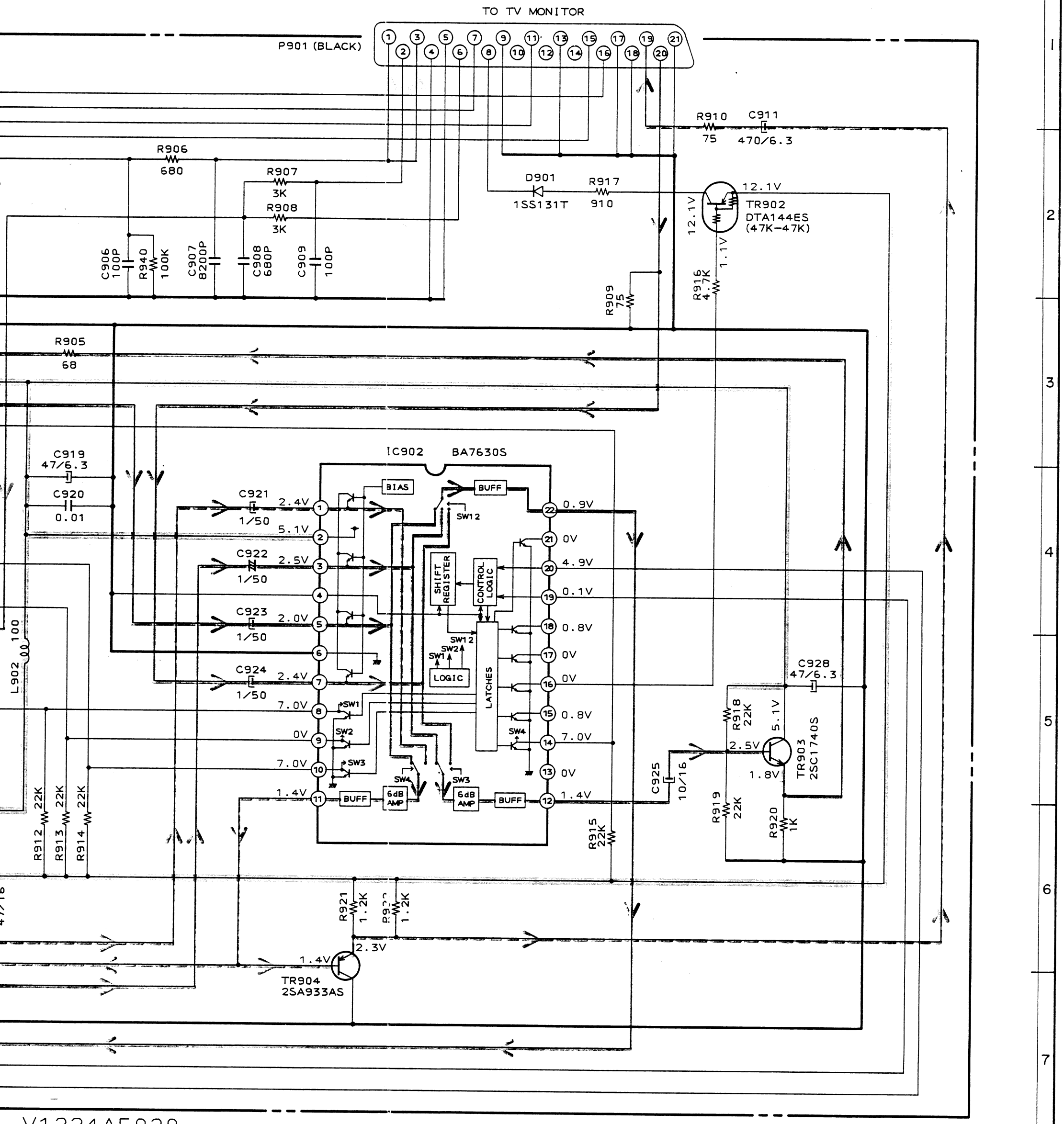
P903

17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
A.IN	IDL12V	A.OUT	GND	V.OUT	IDL5V	V.IN	GND	INT.V	GND	INT.A	GND	MOD.V	DECCTL	MOD.A	C+.CLK	C+.DATA

TO MAIN (2/4) PCB P101
(RF/AUDIO BLK)

CANAL PLUS PCB V1224A5020

: B (POWER SUPPLY) LINE
: PB AUDIO SIGNAL LINE
: REC/EE AUDIO SIGNAL LINE
: PB VIDEO SIGNAL LINE
: REC/EE VIDEO SIGNAL LINE



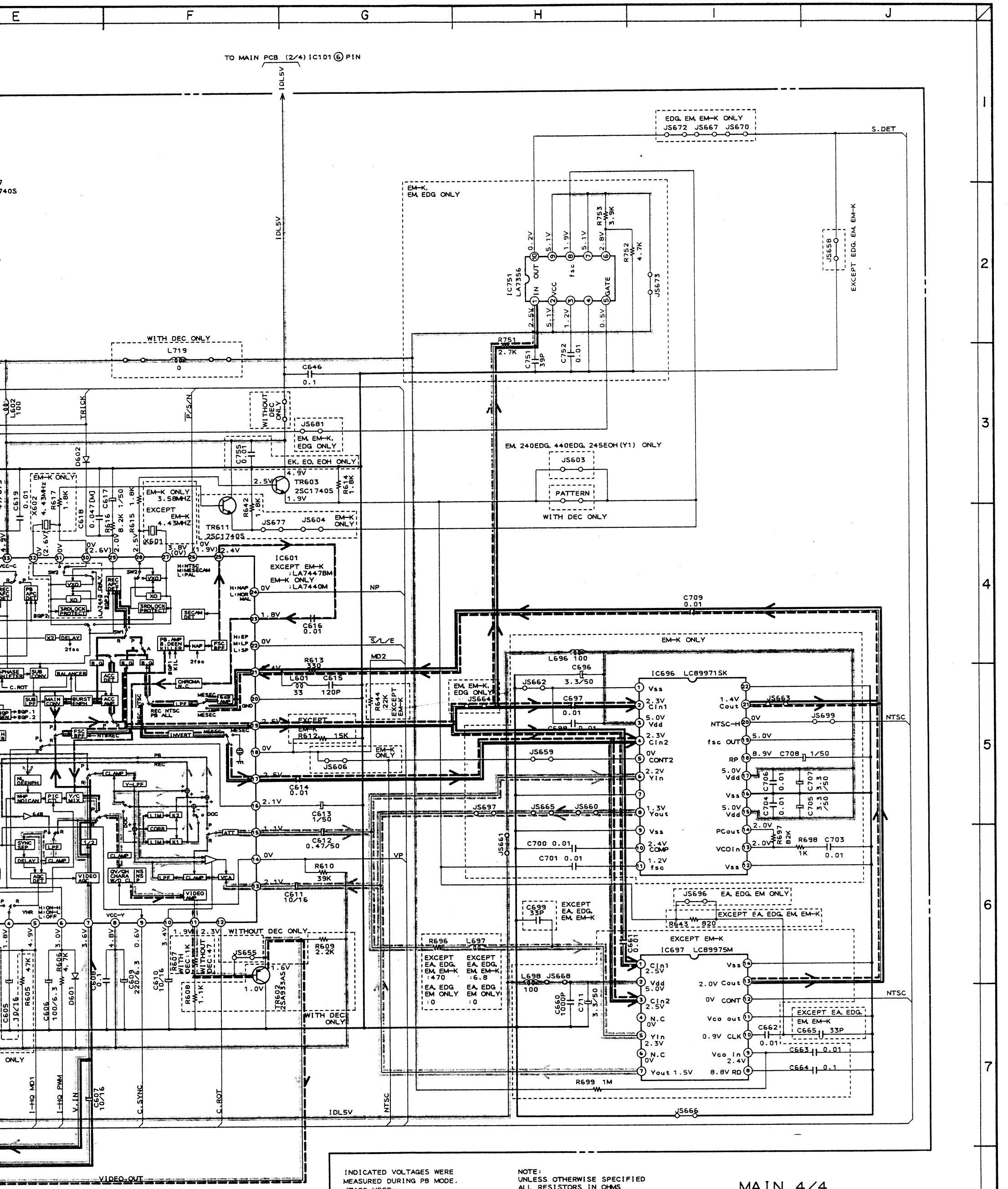
V1224A5020

: B (POWER SUPPLY) LINE
: PB AUDIO SIGNAL LINE
: REC/EE AUDIO SIGNAL LINE
: PB VIDEO SIGNAL LINE
: REC/EE VIDEO SIGNAL LINE

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/4W (J)
ALL CAPACITORS IN μF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV (M)
ALL INDUCTORS IN μH (J)
INDICATED VOLTAGES WERE MEASURED DURING E-E (STOP) MODE.

CANAL PLUS
SCHEMATIC DIAGRAM
No.11-6 V122211M
A2

P601
TO PRE AMP PCB P85I
G2
G4
HEAD CTL
COMP OUT
TRICK
SP
IDL5V
REC SG
PB ENVE
REC.S
V.GND
V.SWP
ENV DET
C.SYNC
DM12V
DM FG
DM CONT
DM PG
M.GND
I-HQ MD2
G4 ONLY
L677
C659 0.01
R652 22K
R654 1K
TR653 DTA144ES
R658 3.9K
C653 G2:12P G4:10P
L652 47
R669
G4:5.6K
G2-EK, EM:4.7K
G2-EXCEPT EK, EM:6.8K
R659 G4:270 G2:150
JS653
R662 0
TR657 2SC1740S
TR654 2SC1740S
TR652 2SC1740S
C651 0.01
L651 39
C652 33P
R656 820
R660 820
L654 220
C656 300P
R663 3.3K
R653 22K
R655 1K
C654 43P
L653 10
R680 1K
L676 4.7
R641 100K
C644 51P
C601 0.01
C680 0.01
L675 100
WITH DEC ONLY
L719 0
IDL5V
TR674 2SC1740S
TR613 2SC1740S
TR612 DTA114ES
TR604 DTC144ES
TR606 2SC1740S
TR672 2SC1740S
TR673 2SC1740S
R686 2.2K
R682 1.5K
R683 1K
R684 6.8K
R681 22K
R680 22K
R679 150
C677 91P
L674 5.6
C676 0.01
R677 1.8K
C675 120P
L673 330
R678 470
R674 3K
R675 1K
C674 0.01
C678 0.01
R685 2.2K
C624 0.022 [M]
C625 1/50
R619 1K
R639 0
C627 0.047
C628
G2-EK, EM, EM-K & G4:0.047 [M]
EXCEPT:0.033 [M]
C629 0.01
D603
G2-EK, EM, EM-K ONLY
R672 1K
R671 1K
C672 150P
L672 220
L671 68
C671 120P
R673 510
C643 0.01
R631 39K
R633 1K
R632 12K
R634 G2-EK, EM G4:560 EXCEPT: 820
C626 0.01
JS680
JS601
L602 100
D602
C621 1/50
L603 68
C622 180P
C620 47/6.3
C619 0.01
X602 4.43MHz
R617 1.8K
C618 0.047 [M]
C617
R616 8.2K 1/50
R615 1.8K
EM-K ONLY 3.58MHZ
EXCEPT EM-K 4.43MHZ
K601
C645 330P
C685 0.01
WITH DEC-EOH, EOG ONLY
TO MAIN PCB 3/4 (SERVO/SYSCON BLK)
DM12V
DM FG
DM.CONT
DM PG
M.GND
S/L/E
C.KILL
COMP OUT
HEAD CTL
I-HQ MD2
I-HQ MD1
P/S/N
I-HQ PWM
SP
C.SYNC
VP
NP
C.ROT
EE
TRICK
ENV DET
V.SWP
REC.S
S.DET
SEC/MES
NTSC
3.58REC
EE
TO MAIN PCB 3/4 (SERVO/SYS BLK)
TO MAIN PCB 1/4 (POWER BLK)
IDL5V
V.GND
TO MAIN PCB 3/4 (SERVO/SYS BLK) TO VPS PDC
V.IN
TO MAIN PCB 2/4 (I/O BLK)
VIDEO IN
VIDEO OUT
SEC. MES
EXCEPT EA, EK
TR608 DTA144ES
L605 33
C636 47P
L606 47
C637 27P
TR610 2SC1740S
WITH DEC
R628 0Ω
PATTERN
WITHOUT DEC
R627 1K
JS602
R622 1.5K
C633 27P
C642 18P
C634 200P
JS674
TR607 2SC1740S
R625 2.2K
R626 470
C648 51P
L610 39
TR614 DTC144ES
JS679
JS678
JS712
EM-K ONLY
3.58R
EE
C630 0.01
C631 10/16
R638 100
R624 4.7K (F)
C635 1/50
R601 2.7K
TR601 DTA114ES
C641 27P
C602 360P
R602 750
C603 5P
R603 1K
C604 0.01
R604 33K
C605 10/16
R605 47K
C606 100/6.3
R606 4.7K
D601
C608 0.1
C609 220/6.3
C610 10/16
R607 (WITH DEC:1K WITHOUT DEC:47)
R608 1.1K
G4, G2-EK, EM, EM-K ONLY
I-HQ MD1
I-HQ PWM
V.IN
C.SYNC
VIDEO OUT
SW1
SW2
VXO
XO
3RDLOCK PROTECT
REC APC DET
PB APC DET
321FH VCO
LPF
PHASE SHIFTER
SUB CONV
BALANCER
ACC DET
C-LPF
SUB LPF
MAIN CONV
BURST ENPH
ACC AMP
BGP GEN
BGP.1
BGP.2
HALF KILLER
FM AGC
DOUBLE LIMIT
FM DEMOD
FM MOD
CARR SHIFT
DOC DET
REQ 4.2V
SUB LPF
MAIN DEENPH
SYNC SEP
DELAY
FMAGC DET
AGC DET
W/D CLIP
DETAIL ENH
MAIN ENPH
NL ENPH
VIDEO AMP
Y-LPF
WHP NOICAN
PIC CTL
Y/C MIX
CORR
LIM
K1
K2
CHROMA N.C
REC NTSC PB ALL
SECAM DET
NAP
PB.AMP KILLER
INVERT
FSC BPF
NTSREC
VCC-C
VCC-Y
N.C
H:NTSC M:MESECAM L:PAL
MAIN PCB V1222A501A/V1224A501A
B (POWER SUPPLY) LINE
PB Y SIGNAL LINE
REC Y SIGNAL LINE
PB CHROMA SIGNAL LINE
REC CHROMA SIGNAL LINE
* 2 HEAD MODELS ARE ABBREVIATED TO "G2" AND 4 HEAD MODELS ARE "G4" IN THIS DIAGRAM.



INDICATED VOLTAGES WERE MEASURED DURING PB MODE.
(TAPE USED:
PAL COLOUR BAR TAPE)
( ) :LA7440M

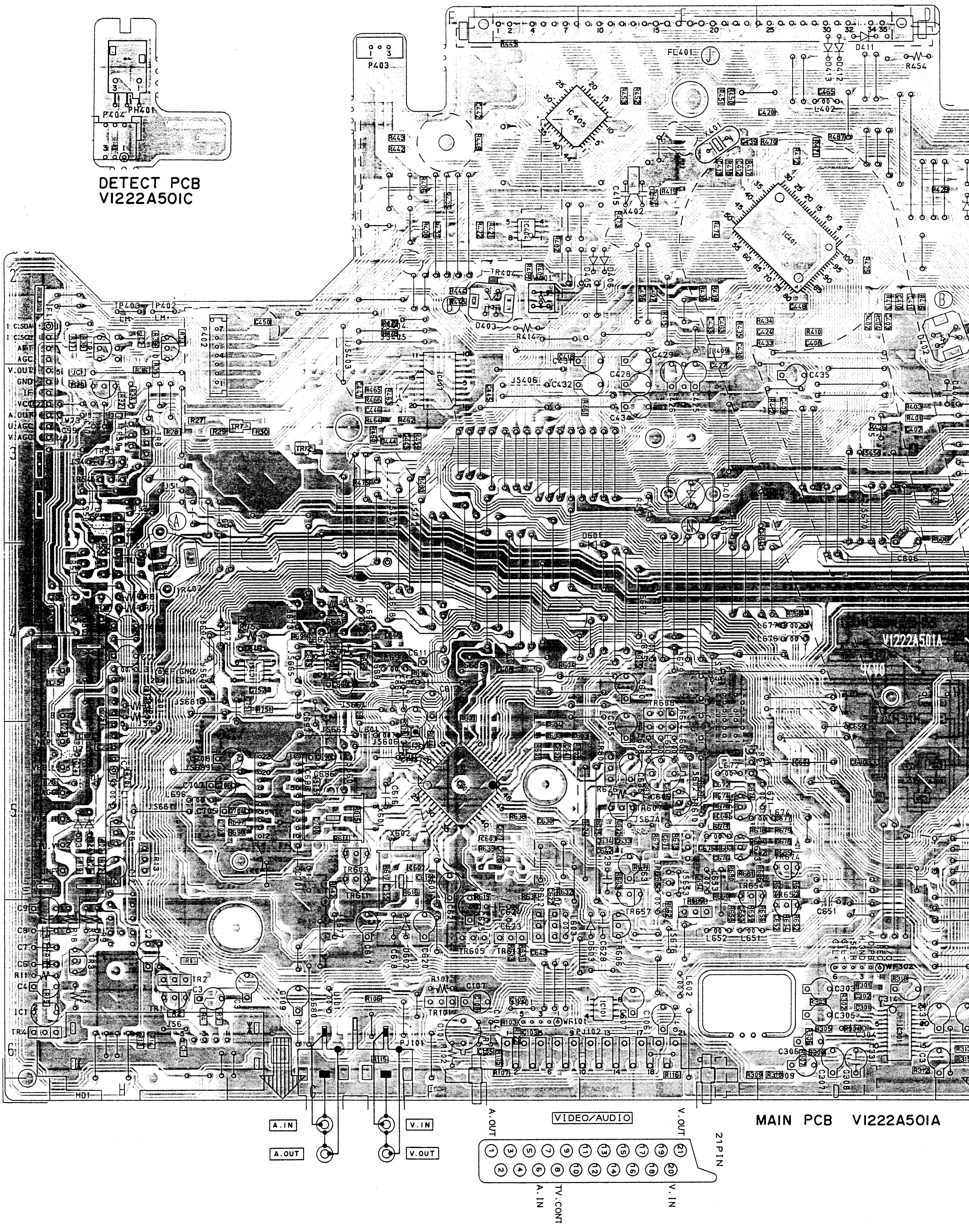
NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV

* 2 HEAD MODELS ARE ABBREVIATED TO "G2" AND
4 HEAD MODELS ARE "G4" IN THIS DIAGRAM.

MAIN 4/4 (VIDEO BLK) SCHEMATIC DIAGRAM

No.11-5 V122205M
A1

DETECT PCB
V1222A501C



V1222A501A
IC401
IC403
IC406
IC201
TR212
TR211
TR213
TR214
TR215
TR216
TR201
TR202
TR203
TR204
TR205
TR207
TR208
TR210
TR217
TR301
TR302
TR351
TR401
TR402
TR403
TR404
TR405
TR409
TR601
TR603
TR604
TR606
TR607
TR608
TR610
TR611
TR612
TR613
TR614
TR652
TR653
TR654
TR656
TR657
TR672
TR673
TR674
TR676
P201
P401
P402
P403
P601
WF101
WF301
WF302
JS201
JS202
JS203
JS204
JS205
JS206
JS207
JS208
JS209
JS210
JS211
JS214
SW401
SW402
SW403
SW404
SW405
SW406
SW407
SW408
SW409
REC
CHANNEL
RESET
POWER
PLAY
FF
RWD
STOP/EJECT
PH201
FR401
FR201
FR202
FR203
FR204
D201
D202
D203
D204
D205
D206
D207
D208
D209
D210
D211
D212
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D220
D221
D222
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D225
D226
D227
D228
D229
D230
D231
D232
L201
L202
L205
L301
L352
L401
L651
L671
L672
L673
L674
L675
L676
L677
FL390
C201
C202
C203
C204
C205
C206
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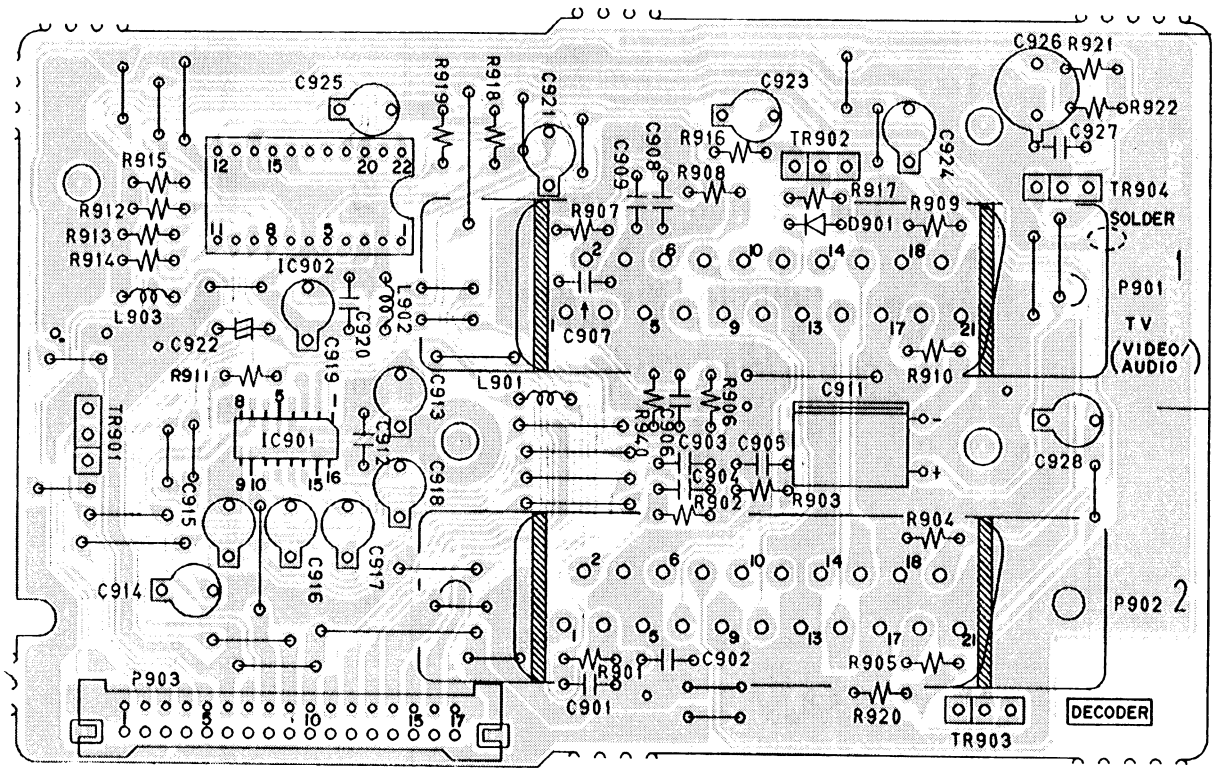
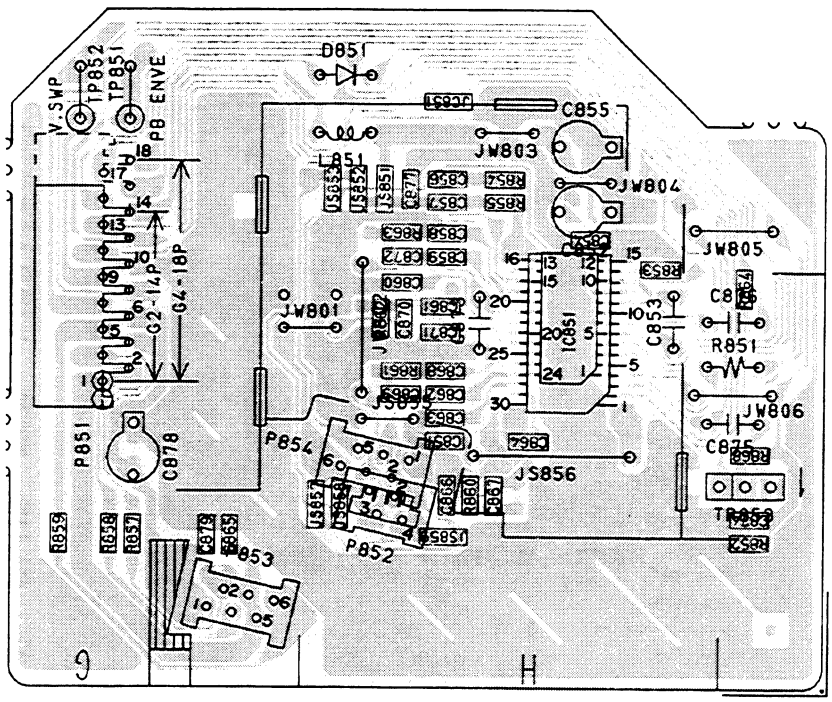
C339
C340

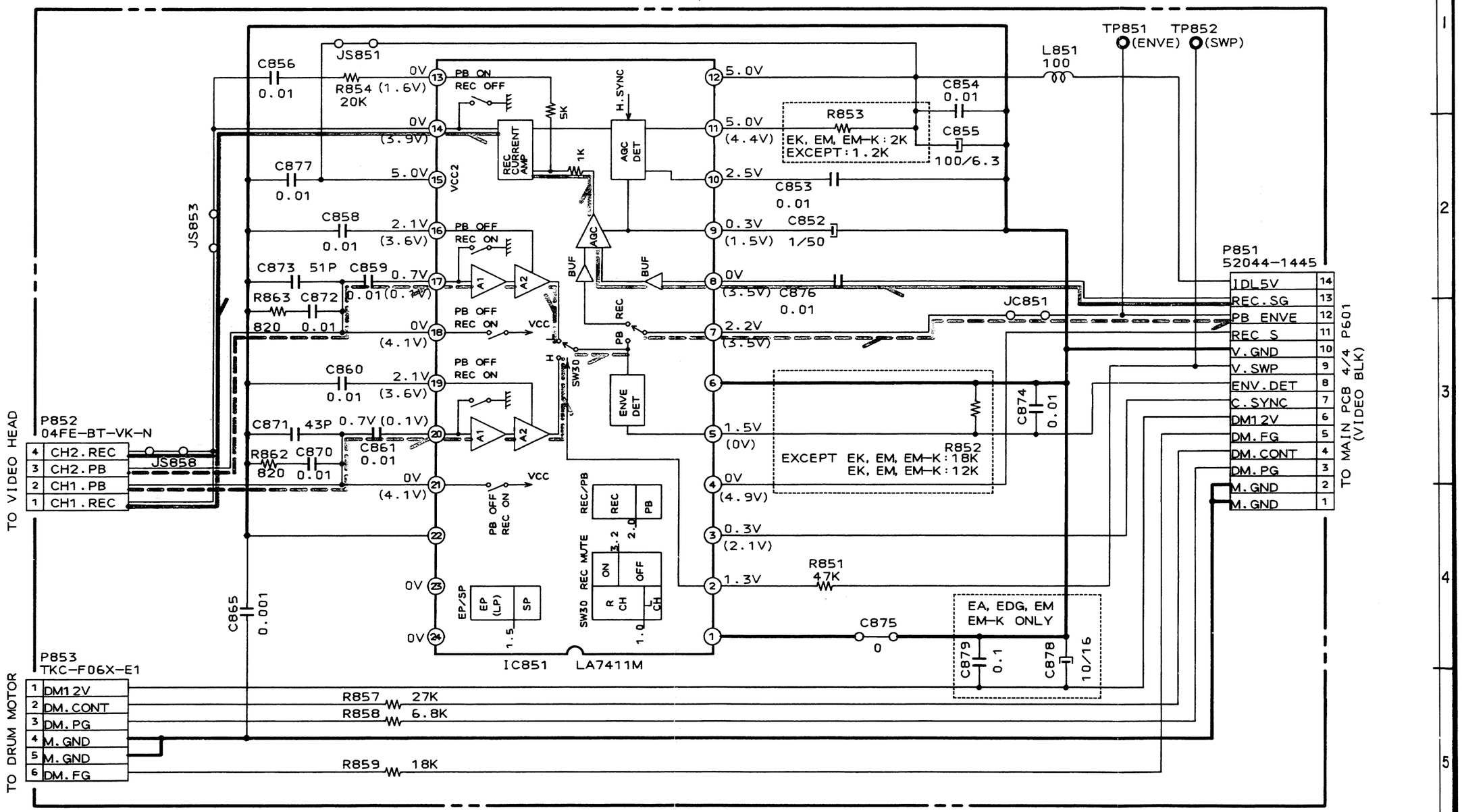


CANAL PLUS PCB V1224A5020



PRE AMP PCB V1222A501B

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.



PRE AMP PCB V1222A501B/V12224A501B

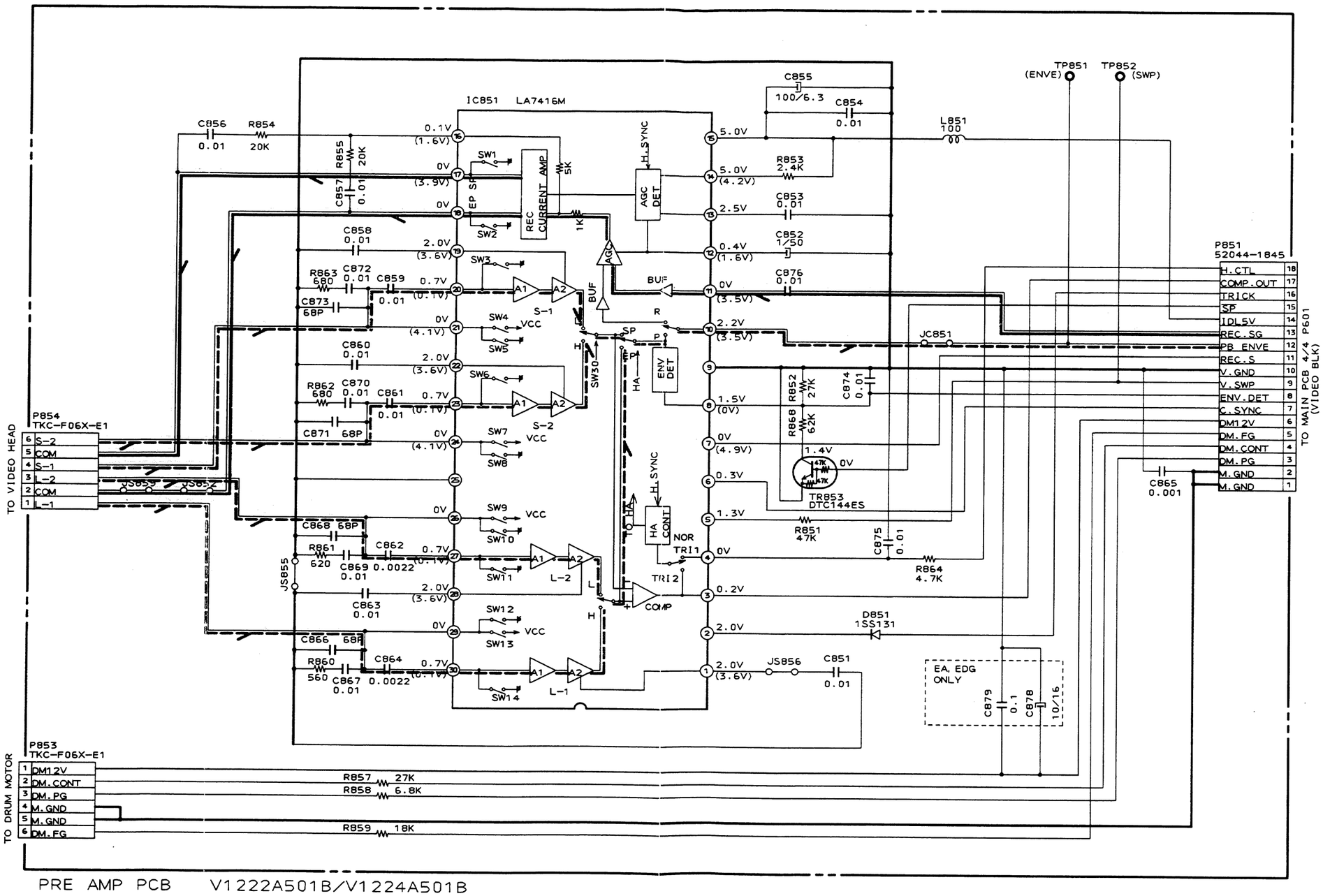
B (POWER SUPPLY) LINE
PB Y SIGNAL LINE
REC Y SIGNAL LINE
PB CHROMA SIGNAL LINE
REC CHROMA SIGNAL LINE

INDICATED VOLTAGES WERE MEASURED DURING PB MODE.
( ) : REC MODE

NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV

PRE AMP (2 HEAD) SCHEMATIC DIAGRAM

No.11-7 V122206M
A3



PRE AMP PCB V1222A501B/V1224A501B

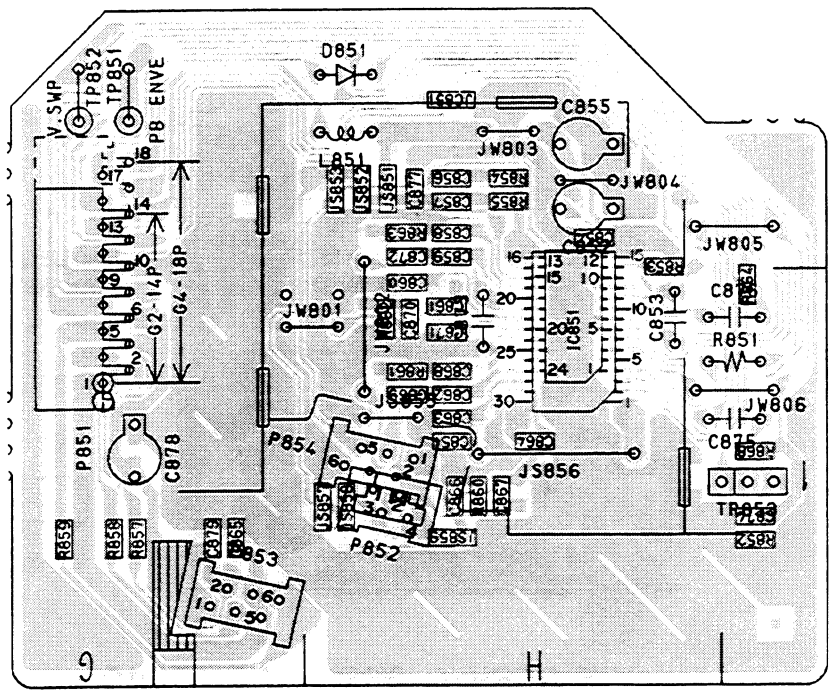
B (POWER SUPPLY) LINE
PB Y SIGNAL LINE
REC Y SIGNAL LINE
PB CHROMA SIGNAL LINE
REC CHROMA SIGNAL LINE

INDICATED VOLTAGES WERE MEASURED DURING PB MODE.
( ) : REC MODE

NOTE:
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS
ALL CAPACITORS IN μF (P=PF)
ALL ELECTROLYTIC CAPACITORS IN μF/WV

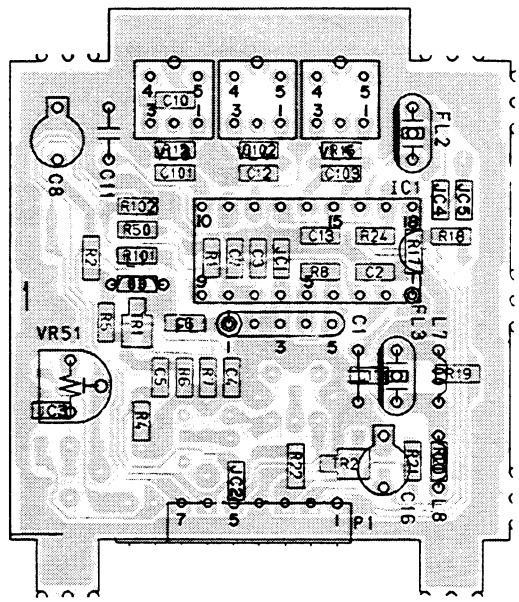
PRE AMP (4 HEAD) SCHEMATIC DIAGRAM

No.11-8 V122207M
A2



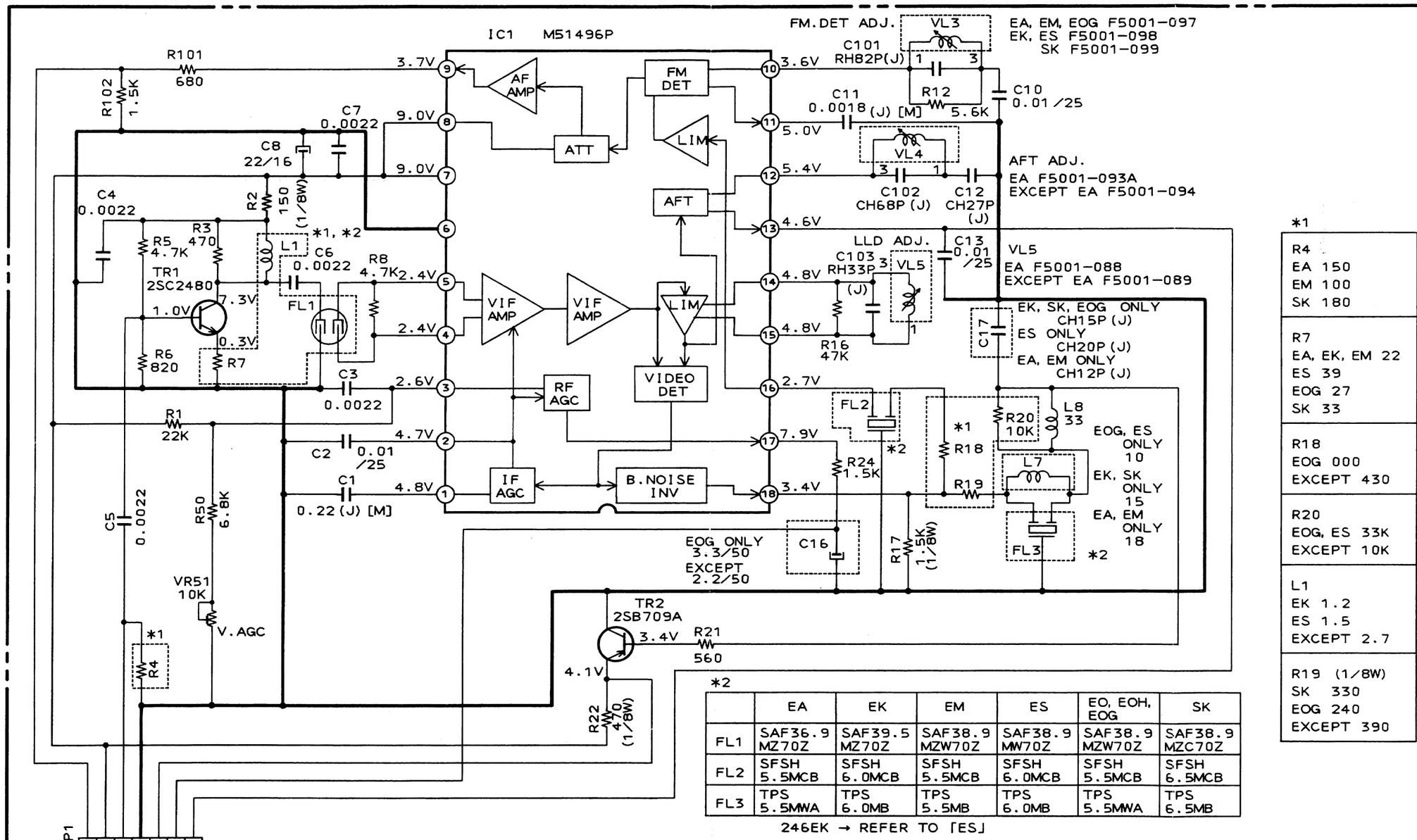
PRE AMP PCB V1224A501B

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.



VIF-NORMAL PCB F5001A5040

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.



*1

R4	
EA	150
EM	100
SK	180
R7	
EA, EK, EM	22
ES	39
EOG	27
SK	33
R18	
EOG	000
EXCEPT	430
R20	
EOG, ES	33K
EXCEPT	10K
L1	
EK	1.2
ES	1.5
EXCEPT	2.7
R19 (1/8W)	
SK	330
EOG	240
EXCEPT	390

*2

	EA	EK	EM	ES	EO, EOH, EOG	SK
FL1	SAF36.9 MZ70Z	SAF39.5 MZ70Z	SAF38.9 MZW70Z	SAF38.9 MW70Z	SAF38.9 MZW70Z	SAF38.9 MZC70Z
FL2	SFSH 5.5MCB	SFSH 6.0MCB	SFSH 5.5MCB	SFSH 6.0MCB	SFSH 5.5MCB	SFSH 6.5MCB
FL3	TPS 5.5MWA	TPS 6.0MB	TPS 5.5MB	TPS 6.0MB	TPS 5.5MWA	TPS 6.5MB

246EK → REFER TO 「ES」

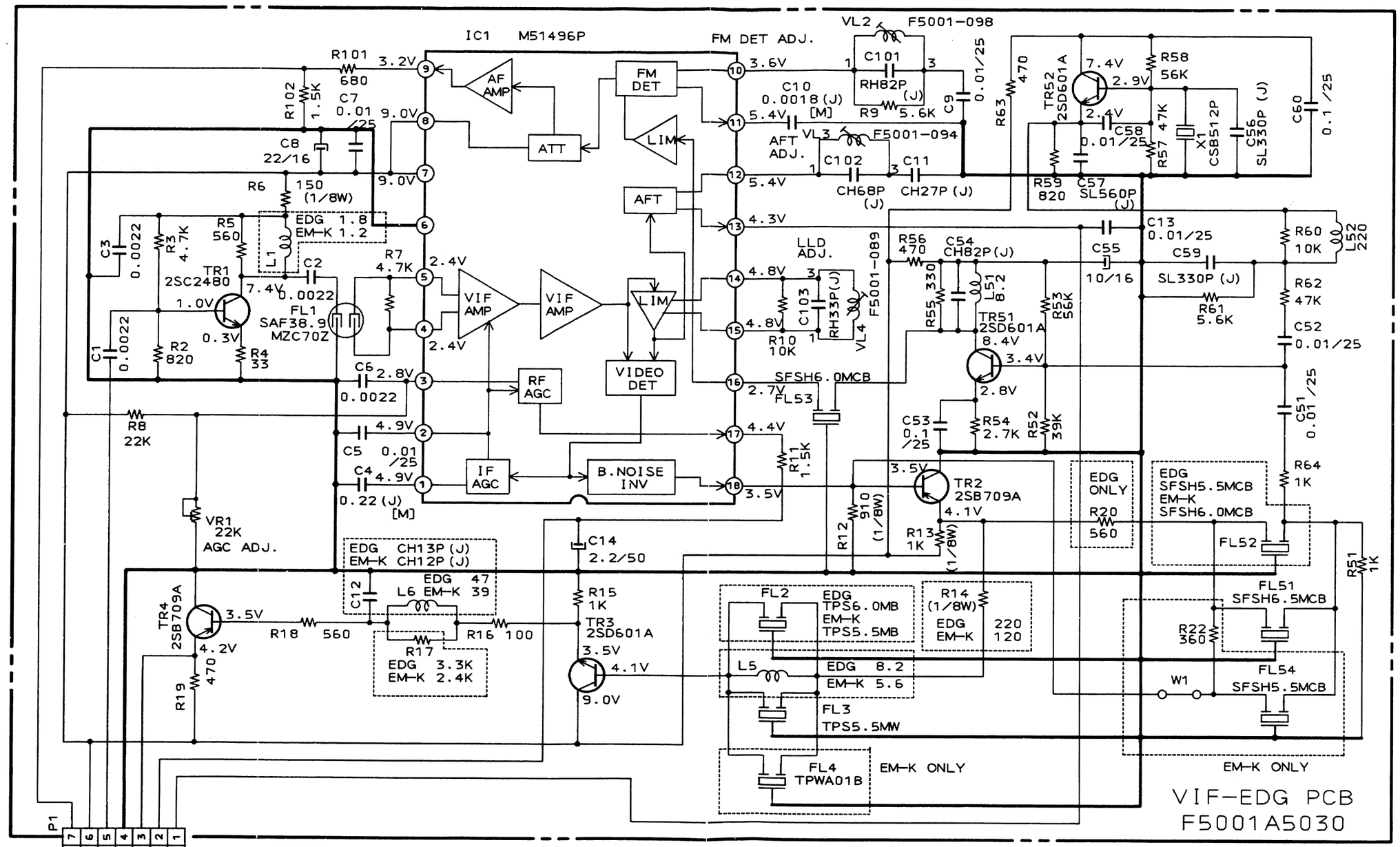
VIF-NORMAL PCB. F5001A5040

B (POWER SUPPLY) LINE

INDICATED VOLTAGES WERE MEASURED DURING E-E (STOP) MODE.
(WHEN A STATION WAS BEING RECEIVED)

NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/10W (J)
ALL CAPACITORS IN μF 50WV (K)
ALL INDUCTORS IN μH (J)
ALL ELECTROLYTIC CAPACITORS IN μF/WV (M)

VIF-NORMAL
SCHEMATIC DIAGRAM
No.11-9 V122208M
A3

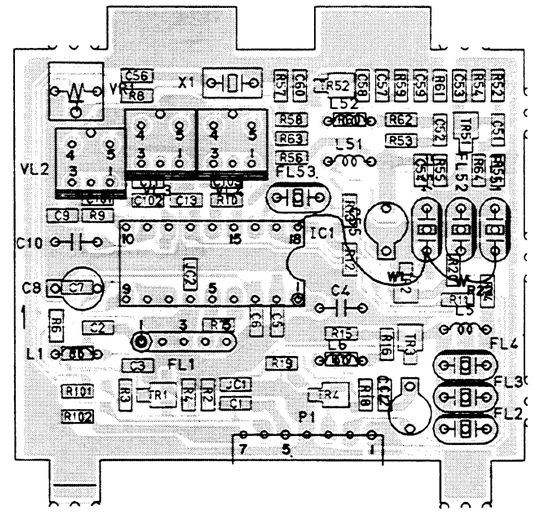


NOTE
UNLESS OTHERWISE SPECIFIED
ALL RESISTORS IN OHMS 1/10W (J)
ALL CAPACITORS IN μF 50WV (K)
ALL INDUCTORS IN μH (J)
ALL ELECTROLYTIC CAPACITORS IN μF/WV (M)

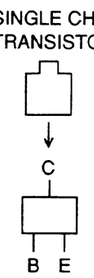
B (POWER SUPPLY) LINE

INDICATED VOLTAGES WERE MEASURED
DURING E-E (STOP) MODE.
(WHEN A STATION WAS BEING RECEIVED)

VS-G240/245/440/445EDG
VS-G250EM-K
VIF-EDG
SCHEMATIC DIAGRAM
No.11-10 V122209M
A3

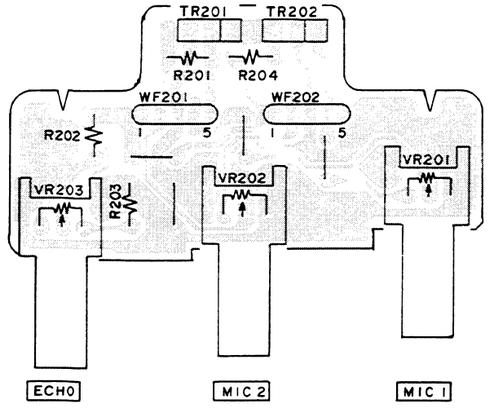


SINGLE CHIP TRANSISTOR

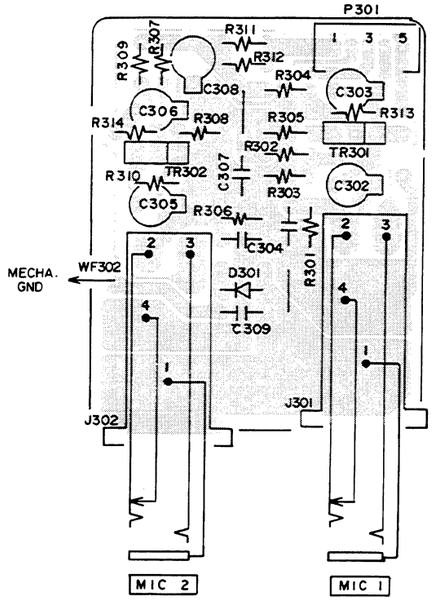


VIF-EDG PCB F5001A5030

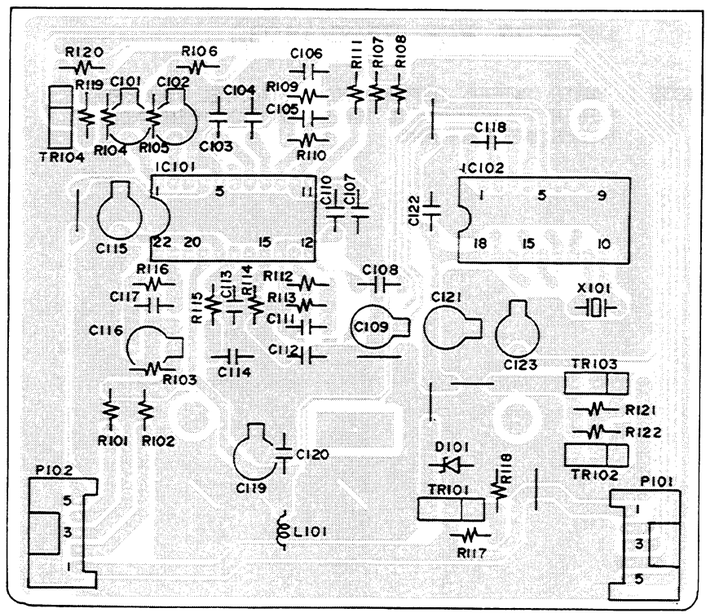
NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.



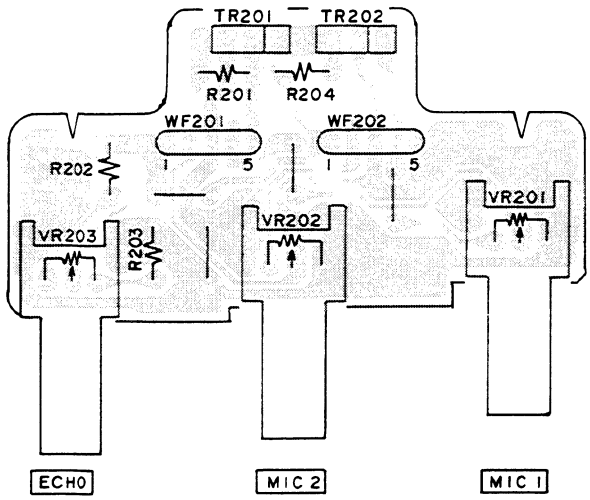
VOLUME PCB V1222A502B



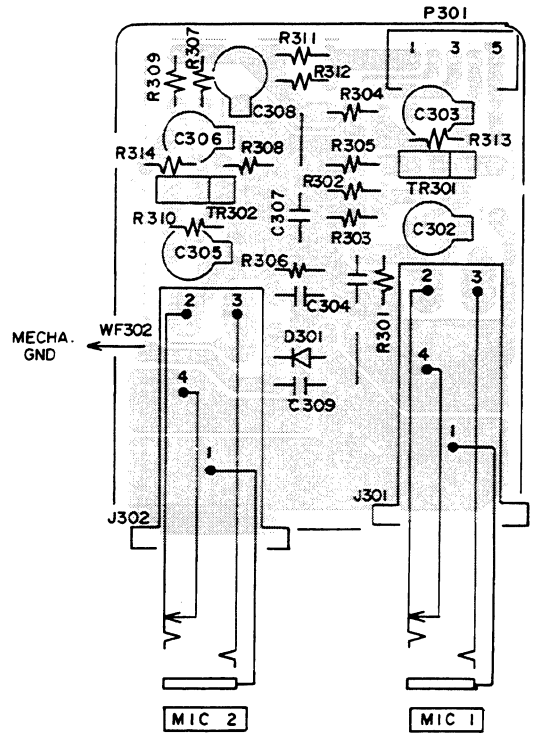
MIC JACK PCB V1222A502C



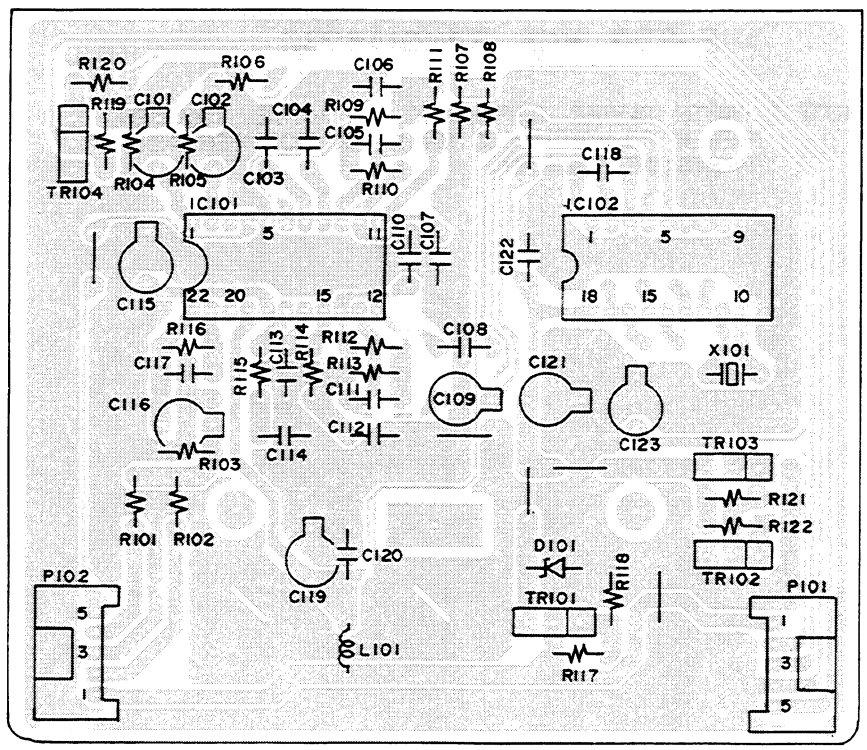
ECHO PCB V1222A502A



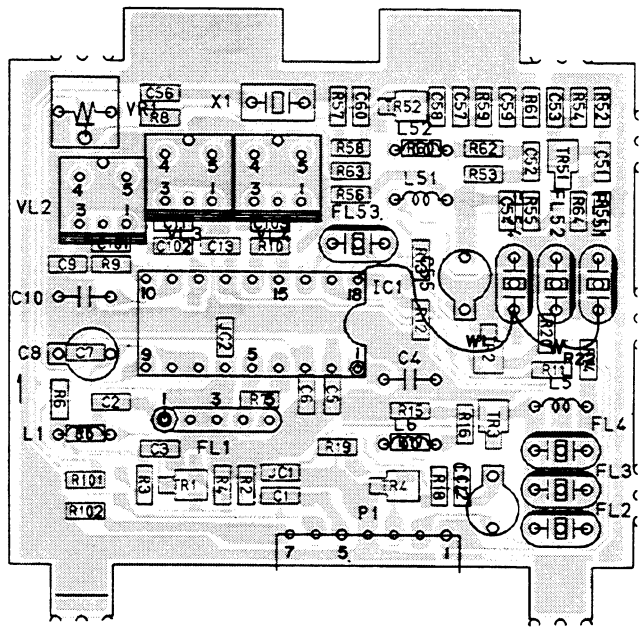
VOLUME PCB V1222A502B



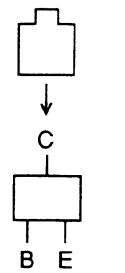
MIC JACK PCB V1222A502C



ECHO PCB V1222A502A



SINGLE CHIP
TRANSISTOR



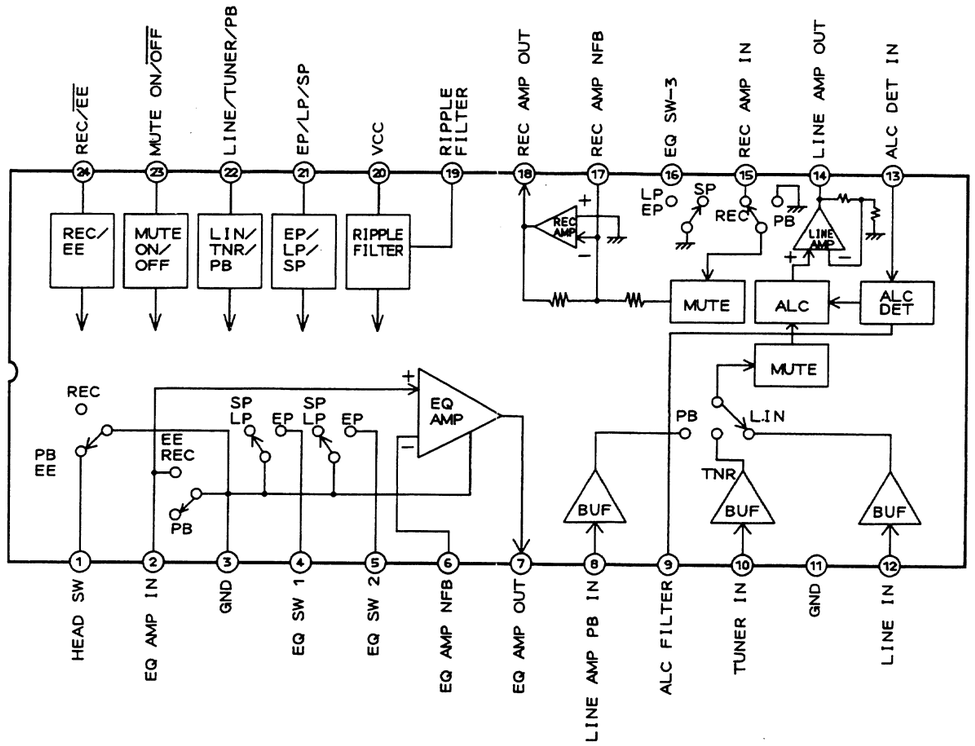
VIF-EDG PCB F5001A5030

NOTE : PARTS DIFFER DEPENDING ON MODEL NUMBER. REFER TO SCHEMATIC DIAGRAMS FOR PERTINENT PARTS INFORMATION.

VS-G250EM-K
KARAOKE
SCHEMATIC DIAGRAM

No.11-11 V122210M
A2

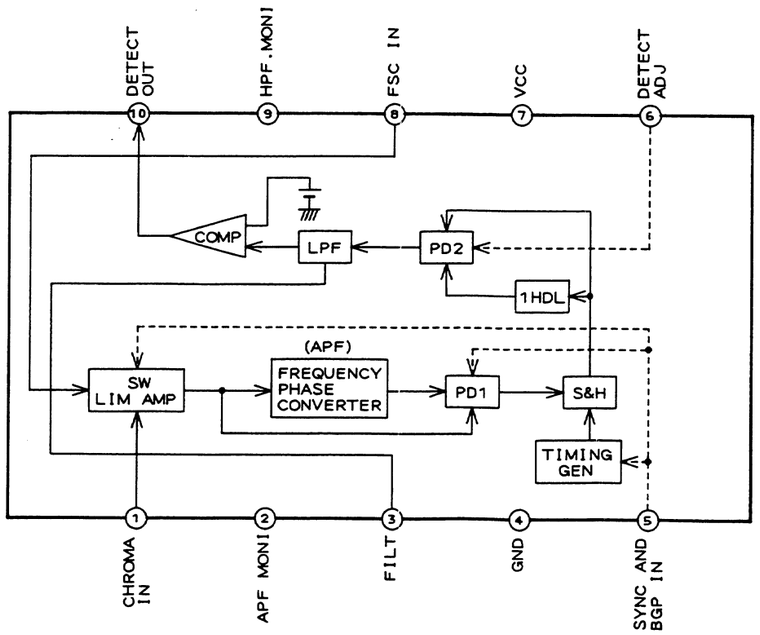
LA7285 (AUDIO SIGNAL REC/PB AMP)



SWITCH FUNCTION

	DC LEVEL		
	0 ~ 1.0V	1.8 ~ 2.6V	3.6V
㉑PIN	SP	LP	EP
㉓PIN	PB	TUNER	LINE

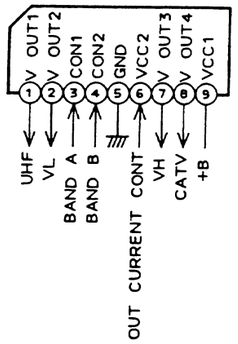
LA7356 (PAL/SECAM DETECTOR)



LA7440M/LA7447BM (Y/C SIGNAL PROCESSOR)

PIN No.	PORT NAME	I/O	FUNCTION
1	MAIN-EMPH	–	Main emphasis filter pin.
2	NL-EMPH	–	Main emphasis filter.
3	PIC-CTL/EDIT	–	Picture control (soft: 2.0 - 2.45 V, hard: 2.55 - 3.0V)/edit (3.8 V or more).
4	AGC-TC2	–	Capacitor connecting pin for AGC DET.
5	YNR-CTL	–	YNR-OFF: 1.0 V or less, YNR-CTL: 1.5 - 2.5 V, YNR-STRONG: 3.5 V or more.
6	NC-CTL	–	NC (noise cancel) off (PB): 1.5 V or less, NC-CTL (PB): 2.0 - 3.0 V.
7	VIDEO-IN	I	REC/E-E video signal input.
8	Vcc	–	+5 V power supply.
9	C-SYNC OUT	O	Composite sync signal output.
10	VCA-FILT	–	Capacitor connecting pin for VCA.
11	VIDEO-OUT	O	E-E or PB video signal out.
12	C.ROT	I	Chroma rotary pulse input.
13	VCA-IN	I	VCA AMP input.
14	QV,QH,CHA-IN	I	Quasi V-pulse & Quasi H-pulse input/character signal input.
15	CCD DRIVE	O	Y signal out pin to Y-CCD.
16	AGC-TC1/BAL	–	Capacitor connection pin for AGC-TC1 and balancer.
17	C-CCD DRIVE1	O	Chroma signal out pin to chroma CCD1.
18	M/$\overline{M}$	–	L: except NTSC (50 Hz), H: NTSC (60 Hz). (7440M only)
	NL-ON	–	L or H: NL OFF, M: NL ON (weak).
	DETAIL-ENHA	–	L or H: detail enhancer normal, M: weak & fc down.
19	C-CCD DRIVE2	O	Chroma signal out pin to chroma CCD2.
20	GND	–	Ground terminal.
21	C-CCD IN	I	Chroma signal input pin from chroma CCD.
22	MODE-CTL	–	SP: 0 - 1.2 V, LP: 2.0 - 2.7 V, EP: 3.9 - 5.0 V.
23	CHROMA-IN	I	Chroma signal input from comb filter.
	SP CS-STOP	–	H: SP carrier shift stop.
24	NAP CTL	–	NAP: 3.3 - 5.0 V, B.M out: 2.0 - 2.7 V, THRU: 0 - 1.2 V.
25	CHROMA-OUT	O	PB chroma signal output. H (SECAM mode): mute ON.
26	$\overline{P}$/S/N	–	Colour mode switching pin (NTSC: 3.9 - 5.0 V, MESEC: 2.0 - 2.7 V, PAL: 0-1.2V).
27	VXO-IN1	I	Crystal1 connecting pin (7440M: 3.58 MHz, 7447BM: 4.43 MHz).
28	VXO-OUT1	O	Crystal1 connecting pin (7440M: 3.58 MHz, 7447BM: 4.43 MHz).
29	REC-APC FIL	–	Capacitor connecting pin for REC APC detector.
	TRICK-H	–	3.9 V or more after COMB in SP mode.
30	XO-OUTA	O	Crystal connecting pin (4.43 MHz, 7440M only).
31	XO-OUTB	O	Crystal connecting pin.
32	VXO-IN2	I	Crystal connecting pin (4.43 MHz, 7440M only).
33	Vcc-1	–	+5 V power supply pin.
34	BGP-OUT	O	Burst gate pulse output pin.
35	FILT-CTL	–	H: 3.58 MHz, L: 4.43 MHz.
36	SLD-FILT	–	Capacitor connecting pin for SLD.
37	AFC/APC FILT	–	Capacitor connecting pin for AFC DET (REC) or APC DET (PB).
38	REC C-OUT	O	REC low chroma signal output.
	PB C-IN	I	PB low chroma signal input.
39	KILL-FILT	–	Capacitor connecting pin for killer detector.
40	KILLER-OUT	O	REC: APC killer out (H: killer ON).
	SLD-OUT	O	PB: side lock detector pulse output.
41	ACC-FILT	–	Capacitor connecting pin for ACC AMP.
42	GND	–	Ground pin.
43	PB FM-IN	I	PB-Y FM signal input.
44	MOD-OUT	O	REC-Y modulator output signal.
	DOC-STOP	–	Drop-out compensator control (H: DOC stop).
45	VREG	–	4.2 V regulator out.
46	REC-Y	O	REC-Y signal output.
	MAIN DE-EMPH OUT	O	Main de-emphasis output.
47	CLAMP	I	Clamp circuit input.
48	EMPH-OUT	–	Main emphasis out.
	R/P CTL	–	REC/PB control (PB: H).

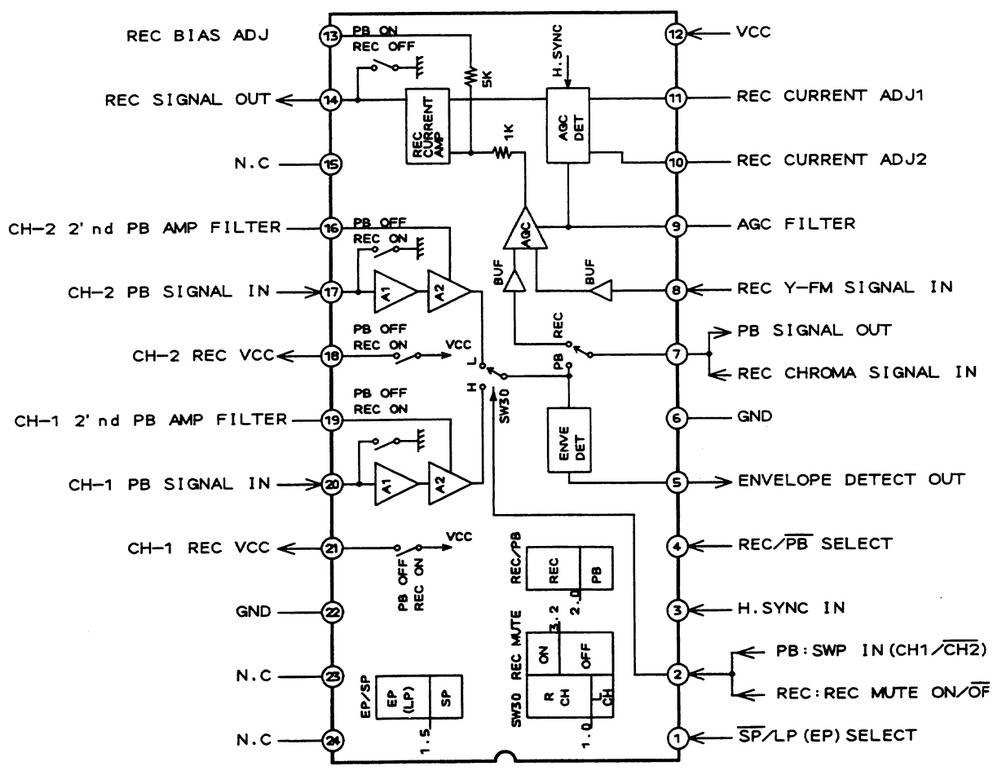
LA7910 (TUNER BAND SELECTOR)



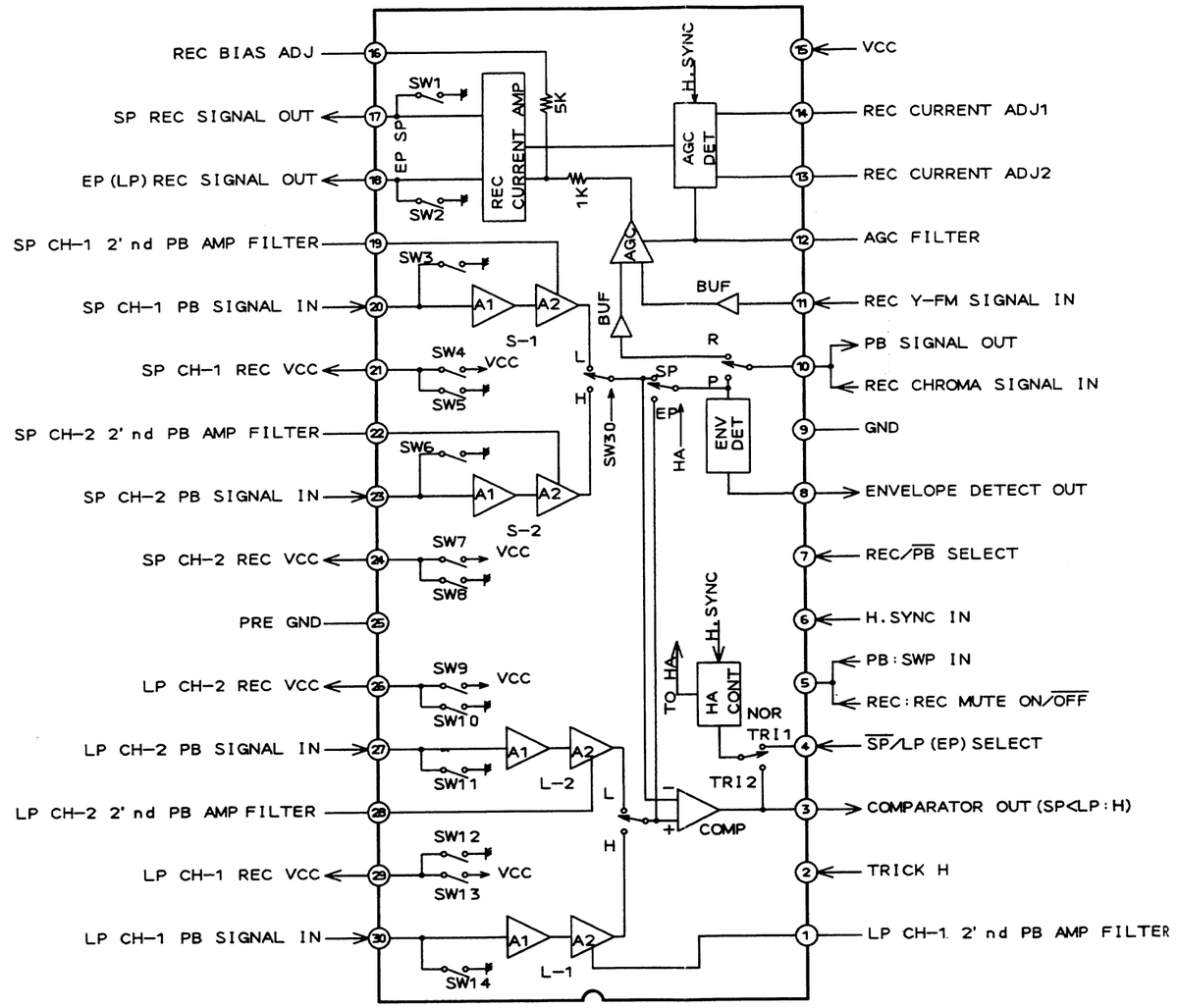
INPUT		OUTPUT			
CON1	CON2	V OUT1	V OUT2	V OUT3	V OUT4
L	L	H	Z	Z	Z
H	L	Z	H	Z	Z
L	H	Z	Z	H	Z
H	H	Z	Z	Z	H

Z:HIGH IMPEDANCE

LM7411M (2-CH HEAD AMP/REC AMP)



LM7416 (4-CH HEAD AMP/REC AMP)



M37774M5H-389GP/390GP/391GP (SYSTEM CONTROL & SERVO MI-COM)

PIN NO.	PORT NAME	I/O	FUNCTION
1	SYS RDY	O	Data transfer ready output.
2	TU PWM	O	Tuning voltage output for tuner (PWM).
3	CM PWM	O	Capstan motor's speed & phase error output (PWM).
4	DM PWM	O	Drum motor's speed & phase error output (PWM).
5	SRP	I	Supply reel pulse input.
6	TRP	I	Take up reel pulse input.
* 7	NP	O	NTSC→PAL/NTSC 4.43 conversion select output (NTSC→PAL: H).
8	C.SYNC	I	Cmposite sync input (for video judge).
* 9	NTSC	O	NTSC mode judge output (NTSC: H).
10	$\overline{EE}$	O	E-E mode control pin.
11	$\overline{REMOCON}$	I	Remote control signal input.
12	REC.S	O	REC start control output (for video section).
13	VP	O	Quasi V pulse signal output.
14	V.SWP	O	Video head switching pulse output.
15	C.ROT	O	Chroma rotation pulse output pin.
16	HEAD CTL	O	Video head SP/LP select.
17	COMP OUT	O	Comparator input (for head select when CUE/REV).
18	I-HQ PWM	O	I-HQ ANC voltage output.
19	$\overline{S}$/L/E	O	Circuit switching regarding the tape speed (SP/LP/EP).
20	$\overline{P.DOWN}$	I	Power down detect input.
21	$\overline{SHORT}$	I	Power supply abnormal condition detect input (L : REG voltage is too high).
22 ~ 25	RSW1 ~ 4	I	Input from the rotary (mecha position detect) switch 1 ~ 4.
26,81	VCC	–	+5 V power supply.
27	TRQUP	O	Loading motor torque control.
28	LM F	O	Loading motor direction control (forward).
29	LM R	O	Loading motor direction control (reverse).
30,44,53	N.C	–	No connection.
31	A.EE2	O	Audio EE/$\overline{PB}$ select control output.
32	$\overline{A.OSC}$	O	Audio bias OSC start control.
33	A.REC	O	Audio REC start control.
34	A.EE	O	Audio EE/$\overline{PB}$ select control output.
35	NUB	–	No connection.
36	NUA	–	No connection.
37	$\overline{RESET}$	I	Reset input.
38	X IN	I	Main clock OSC input (f = 16 MHz).
39	X OUT	O	Main clock OSC output (f = 16 MHz).
40	CLK SEL	I	Clock select input (H : main & sub clock OSC are active, L : only sub clock OSC is active).
41	VSS	–	Ground.
42	XC IN	I	Sub clock OSC input (f = 32.768 kHz).
43	XC OUT	O	Sub clock OSC output (f = 32.768 kHz).
45	$\overline{INT}$/EXT	O	Input select control output.
46	$\overline{TV}$/VCR	O	TV/VIDEO select control output.
47	I² C SDA	I/O	EEP ROM serial data input/output.
48	I² C SCL	O	EEP ROM serial clock output.
49	T.MUTE	O	Tuner mute control.
50	A.MUTE	O	Audio mute control.
51	V.SYNC MON	O	V.SYNC monitor output.
52	I-HQ MD2	O	I-HQ mode control out (high output level tape).
54	$\overline{AFT}$	O	AFT on/off control output.
55	BAND B	O	Tuner band select output.
56	BAND A	O	Tuner band select output.
57	C+.DATA	O	Control data for Video/Audio signal IN/OUT switching IC.
58	VPS RDY	I	VPS/PDC MI-COM code data transfer ready signal input.
59	REC SAF	I	REC safety SW input.
60	$\overline{T.POWER}$	O	AL 9 V ON/OFF control / Echo signal muting control. (EM-K only)
61	$\overline{F}$/R	O	Capstan motor direction control (FWD/REV).
62	CM STOP	O	Capstan motor stop control.

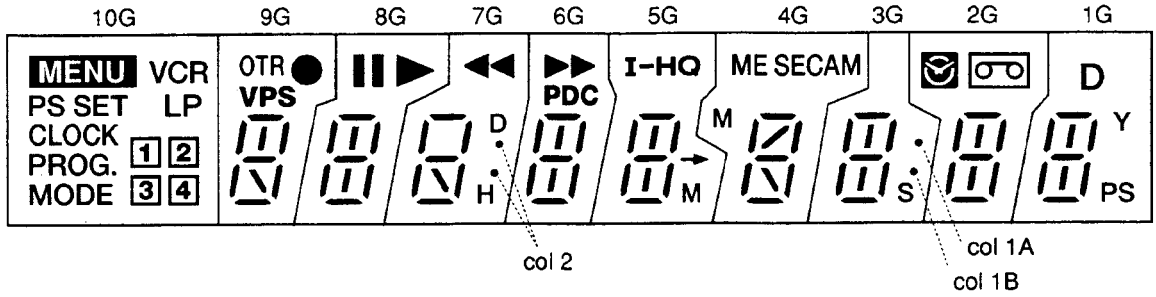
PIN NO.	PORT NAME	I/O	FUNCTION
63	DEC.CTL	I	Decoder on/off control input.
64	$\overline{CTL.GAIN}$	O	CTL AMP gain select control when FF/REW .
65	AMP VCC	O	+5 V power supply for analog AMP section.
66	DM.PG	I	Drum motor PG signal input.
67	DM.FG	I	Drum motor FG signal input.
68	CM.FG	I	Capstan motor FG signal input.
69	AMP VREF OUT	O	Reference voltage output for analog AMP.
70	AMP VREF IN	I	Reference voltage input for analog AMP.
71	CLAMPF	I	CTL clamp AMP positive input.
72	CLAMPR	I	CTL clamp AMP negative input.
73	CTLAMP OUT	O	CTL AMP output.
74	AMP.C	–	Capacitor connecting pin for CTL AMP.
75	CTLAMP IN	I	CTL AMP input.
76	CTL+SWOUT	O	CTL switched output.
77	CTL+	I	CTL positive side input/output.
78	CTL–	I	CTL negative side input/output.
79	CTL VSS	–	Ground for CTL.
80	AMP VSS	–	Ground for AMP.
82	VREF	–	Reference voltage input for A/D convertor.
83	SDP	I	SECAM (MESECAM) judge input (SECAM/MESEC:H).
84	CK	I	4.43/3.58 NTSC video judge input.
85	ES	I	End sensor input.
86	SS	I	Start sensor input.
87	I-HQ MD1	O	I-HQ mode control output (low output level tape).
* 88	3.58REC	O	3.58 MHz NTSC recording control (EM-K only).
89	$\overline{INT}$/EXT	O	Internal/external input select control. (Without DEC model only.)
	C+.CLK	O	Clock signal to Video/Audio signal IN/OUT switching IC. (With DEC model only)
90	AFT	I	AFT error signal (analog) input.
91	TRICK	O	H when trick mode.
92	ENV.DET	I	Video envelope detect input.
93	C.SYNC	I	Composite sync input (for internal Vsync separator).
* 94	$\overline{P}$/S/N	O	PAL/SECAM/NTSC select control.
* 95	SEC.MES	O	PAL/SECAM/MESECAM select control.
96	$\overline{SP}$	O	Tape speed select output.
97	EE	O	EE control pin.
98	SYS SO	O	Serial data out to operation MI-COM
99	SYS SI	I	Serial data in from operation MI-COM.
100	SYS CLK	O	Serial clock output to operation MI-COM.

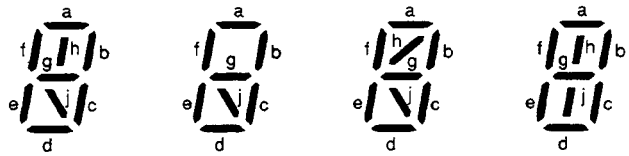
* COLOUR SYSTEM CONTROL CONDITION

			$\overline{SEC.MES}$ 95 PIN		3.58REC 88 PIN		$\overline{P}$/S/N 94 PIN		NTSC 9 PIN		NP 7 PIN	
INPUT SIGNAL	MODE		REC	PB	REC	PB	REC	PB	REC	PB	REC	PB
PAL, SECAM	AUTO	S-DET 'L'	H	H	L	L	L	L	L	L	L	L
		S-DET 'H'	L	L	L	L	M	M	L	L	L	L
	MANU	PAL	H	H	L	L	L	L	L	L	L	L
		MESECAM	L	L	L	L	M	M	L	L	L	L
NTSC	3.58LINE REC		H	–	H	–	H	–	H	–	L	–
	4.43LINE REC		H	–	L	–	H	–	H	–	L	–
	N→P PB		–	H	–	L	–	H	–	H	–	H
	4.43NT PB		–	H	–	L	–	H	–	H	–	L

FLD FV681G

GRID ASSIGNMENT





ANODE CONNECTION

	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
P1	MENU	a	a	a	a	a	a	a	a	a
P2	1	b	b	b	b	b	b	b	b	b
P3	3	c	c	c	c	c	c	c	c	c
P4	CLOCK	d	d	d	d	d	d	d	d	d
P5	MODE	e	e	e	e	e	e	e	e	e
P6	2	f	f	f	f	f	f	f	f	f
P7	4	g	g	g	g	g	g	g	g	g
P8	PS SET	h	h	col 2	h	h	h	h	h	h
P9	PROG.	j	j	j	j	j	j	j	j	j
P10	VCR	OTR	▮	◀◀	▶▶	I-HQ	ME	S		D
P11	LP	VPS	▮	D	PDC	→	M	col 1A		Y
P12	—	●	▶	H	—	M	SECAM	col 1B	—	PS

8. VIF-NOR BLK (EXCEPT EDG,EM-K)

Ref. No.	Part No.	Description
FL1-A	EH-373916N	FILTER CE SAF36.9MZ70Z [EA]
FL1-B	EH-373917N	FILTER CE SAF39.5MZ70Z [G240/G245/G445EK]
FL1-C	EH-432629N	FILTER CE SAF38.9MZW70Z [EM,EO,EOH,EOG]
FL1-D	EH-376120N	FILTER CE SAF38.9MW70Z [G246EK]
FL2-A	EH-433121N	FILTER CE SFSH5.5MCB-TF21 T05 [EXCEPT EK]
FL2-B	EH-433122N	FILTER CE SFSH6.0MCB-TF21 T05 [EK]
FL3-A	EH-368948N	FILTER CE TPS5.5MWA 5.5000MHZ [EA,EO,EOH,EOG]
FL3-B	EH-405642N	FILTER CE TPS6.0MB-TF21 T05 [EK]
FL3-C	EH-416618N	FILTER CE TPS5.5MB-TF21 T05 [EM]
IC1	EI-368809N	IC M51496P
L1-A	EO-428463N	COIL FIX 1 EL0405RA T05 2R7J [EXCEPT EK]
L1-B	EO-403936N	COIL FIX 1 EL0405RA T05 1R2J [G240/G245/G445EK]
L1-C	EO-432680N	COIL FIX 1 EL0405RA T05 1R5J [G246EK]
L7-A	EO-408957N	COIL FIX 1 EL0405RA T05 180J [EA,EM]
L7-B	EO-419251N	COIL FIX 1 EL0405RA T05 150J [G240/G245/G445EK]
L7-C	EO-410256N	COIL FIX 1 EL0405RA T05 100J [EO,EOH,EOG,G246EK]
L8	EO-403273N	COIL FIX 1 EL0405RA T05 330J
TR1	ET-432740N	TR C.2SC2480 T,S TXT08E
TR2	ET-416932N	TR C.2SB709A R,S TXT08E
VL3-A	EO-432610N	COIL TUN 1 F5001-097 SIF [EXCEPT EK]
VL3-B	EO-432611N	COIL TUN 1 F5001-098 SIF [EK]
VL4-A	EO-432605N	COIL TUN 1 F5001-093A AFT [EA]
VL4-B	EO-432607N	COIL TUN 1 F5001-094 AFT [EXCEPT EA]
VL5-A	EO-432600N	COIL TUN 1 F5001-088 LLD [EA]
VL5-B	EO-432601N	COIL TUN 1 F5001-089 LLD [EXCEPT EA]
VR51	EV-389476N	R S-FIX H T05EVNDXAA03 0.1W103

9. PRE-AMP P.C. BOARD

Ref. No.	Part No.	Description
D851	ED-307573N	D SILICON H 1SS131T-77 T26 [4HEADS MODEL]
IC851-A	EI-432778N	IC LA7416M-TP-T1 FPT1T24P [4HEADS MODEL]
IC851-B	EI-432779N	IC LA7411M-TP-T1 FPT1T24P [2HEADS MODEL]
L851	EO-345881N	COIL FIX 1 EL0606SKI 101J
P851-A	EJ-422061N	SOCKET 00 6216 018 100 18P [4HEADS MODEL]
P851-B	EJ-432818N	SOCKET 52044-1445 14P [2HEADS MODEL]
P852	EJ-428388N	SOCKET 04FE-BT-VK-N 4P [2HEADS MODEL]
P853	EJ-422094N	SOCKET TKC-F06X-E1 6P
P854	EJ-422094N	SOCKET TKC-F06X-E1 6P [4HEADS MODEL]
TR853	ET-361961N	TR DTC144ES T05 [4HEADS MODEL]

10. DETECT P.C. BOARD

Ref. No.	Part No.	Description
PH401	ET-432910N	DETECTOR GP1U271X

11. CANAL PLUS P.C. BOAR (EDG, G245/G445EDG, G240EOH(E), G254EOH(Y1), G255/G455EOH)

Ref. No.	Part No.	Description
D901	ED-307573N	D SILICON H 1SS131T-77 T26
IC901	EI-429904N	IC BA7631F
IC902	EI-425188N	IC BA7630S
L901	EO-345881N	COIL FIX 1 EL0606SKI 101J
L902	EO-345881N	COIL FIX 1 EL0606SKI 101J
L903	EO-345881N	COIL FIX 1 EL0606SKI 101J
P901	EJ-427524N	SOCKET 21PIN-S BLACK 21P
P902	EJ-427523N	SOCKET 21PIN-S BLUE 21P
P903	EJ-429905N	SOCKET TSK-B17X-A1 17P
TR901	ET-361961N	TR DTC144ES T05
TR902	ET-364291N	TR DTA144ES T05
TR903	ET-392663N	TR 2SC1740S R,S T05
TR904	ET-392746N1	TR 2SA933AS R,S T05

12. ECHO P.C. BOARD (EM-K)

Ref. No.	Part No.	Description
D101	ED-404220N	D ZENER H MTZJ9.1B T26
IC101	EI-430862N	IC BA7725S
IC102	EI-430864N	IC BU9252S
L101	EO-403270N	COIL FIX 1 EL0405RA T05 101J
L102	EO-403270N	COIL FIX 1 EL0405RA T05 101J
TR101	ET-419014N	TR 2SC1741S Q,R T05
TR102	ET-354365	TR DTC114YS
TR103	ET-364082N	TR DTA114TS T05
TR104	ET-392663N	TR 2SC1740S R,S T05
X101	EI-430866N	OSC CE CSB455E 455KHZ

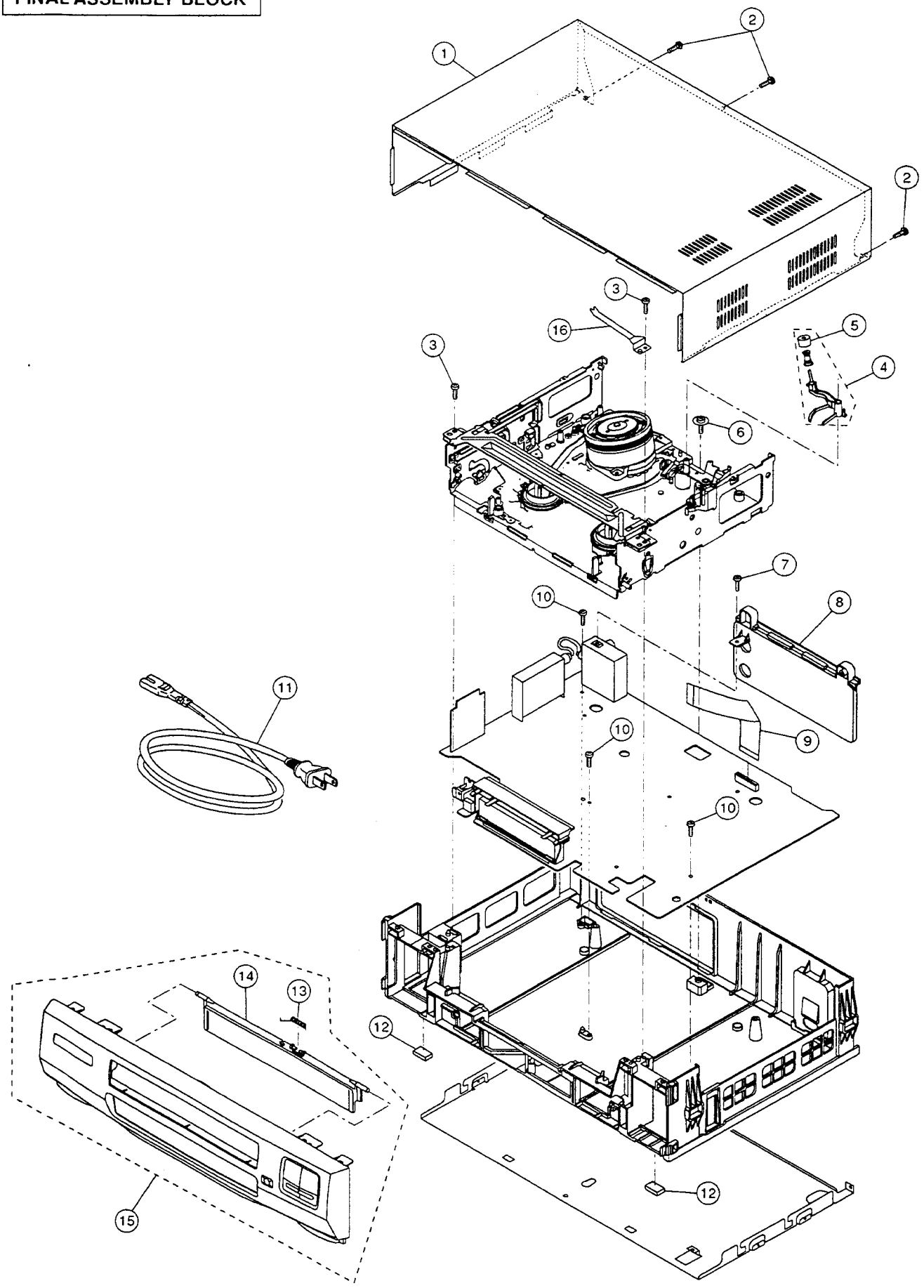
13. VOLUME P.C. BOARD (EM-K)

Ref. No.	Part No.	Description
TR201	ET-361901N	TR DTC124ES T05
TR202	ET-392746N1	TR 2SA933AS R,S T05
VR201	EV-433090N	VR ROTA.RK09K1110 H6.5L20 A502
VR202	EV-433090N	VR ROTA.RK09K1110 H6.5L20 A502
VR203	EV-433092N	VR ROTA.RK09K1110 H6.5L20 B203

14. MIC JACK P.C. BOARD (EM-K)

Ref. No.	Part No.	Description
D301	ED-307573N	D SILICON H 1SS131T-77 T26
J301	EJ-433131N	PHONE J 3P YKB21-5248 6.3
J302	EJ-433131N	PHONE J 3P YKB21-5248 6.3
TR301	ET-392663N	TR 2SC1740S R,S T05
TR302	ET-392663N	TR 2SC1740S R,S T05

FINAL ASSEMBLY BLOCK



15. FINAL ASSEMBLY BLOCK

Ref. No.	Part No.	Description
1	SP-433447N	COVER UPPER GX(2) (SG)
2	ZS-393515N	BT BID30X10STL BZN (SG)
3	ZS-426412N	BT BID30X10STL CMT (SG)
4	HZ-428509N	HEAD CLEANER PART (SG) [EXCEPT G240/G440EA, G245/G445EK/EO]
5	HZ-417681N	ROLLER HEAD CLEANER(2) (SG) [EXCEPT G240/G440EA, G245/G445EK/EO]
6	ZS-426416N	BT PAN30X10STL CMT C080 (SG)
7	ZS-323728N	BID30X05STL CMT (SG)
8-A	SP-432477N	PANEL REAR JACK EA2 (SG) [EA,EM]
8-B	SP-429099N	PANEL REAR JACK EDG (SG) [G240/G440EDG]
8-C	SP-429100N	PANEL REAR JACK EK (SG) [EK,EO,G240/G241/G245/G445EOH(Y1)]
8-D	SP-432478N	PANEL REAR JACK EM-K (SG) [EM-K]
8-E	SP-432488N	PANEL REAR JACK EDG2 (SG) [G245/445EDG]
8-F	SP-432487N	PANEL REAR JACK EOG2 (SG) [EOG]
8-G	SP-432485N	PANEL REAR JACK EOH2 (SG) [G240EOH[E],G254EOH[Y1],G255/ G455EOH]
9-A	EW-432812N	CORD FFC BD P1.25 L130 14P [2HEADS MODEL]
9-B	EW-422530J	CORD FFC BD P1.25 L150 18P [4HEADS MODEL]
10	ZS-376521N	BT BID30X08STL CMT (SG)
11-A	EW-425599N	AC CORD 200S CW2101CW4771 B S [EA]
11-B	EW-430842N	AC CORD 200S SF200 SF201 E [EXCEPT EA]
12	SA-422907N	FOOT AX (SG)
13	ZG-429541N	SP MASK(4) (SG)
14-A	SE-432523N	MASK CASSETTE VS-G240(E) (SG) [G240EOH]
14-B	SE-432551N	MASK CASSETTE VS-G240(E2) (SG) [G240EA/EDG]
14-C	SE-432550N	MASK CASSETTE VS-G240(E3) (SG) [G240EM]
14-D	SE-433857N	MASK CASSETTE VS-G240(E4) (SG) [G240EK]
14-E	SE-432549N	MASK CASSETTE VS-G241(E) (SG) [G241EOH]
14-F	SE-432548N	MASK CASSETTE VS-G245(E) (SG) [G245EA]
14-G	ES-432547N	MASK CASSETTE VS-G245(E2) (SG) [G245EDG]
14-H	SE-432546N	MASK CASSETTE VS-G245(E3) (SG) [G245EK]
14-I	SE-432545N	MASK CASSETTE VS-G245(E4) (SG) [G245EO/EOH]
14-J	SE-433818N	MASK CASSETTE VS-G246(E) (SG) [G246EA]
14-K	SE-433476N	MASK CASSETTE VS-G246(E) (SG) [G246EK]
14-L	SE-432536N	MASK CASSETTE VS-G247(G) (SG) [G247EOG]
14-M	SE-433474N	MASK CASSETTE VS-G250(E) (SG) [G250EM-K]
14-N	SE-432543N	MASK CASSETTE VS-G255(E) (SG) [G255EOH[E]]
14-O	SE-432542N	MASK CASSETTE VS-G255(E2) (SG) [G255EOH[Y1]]
14-P	SE-432535N	MASK CASSETTE VS-G257(G) (SG) [G257EOG]
14-Q	SE-432544N	MASK CASSETTE VS-G254(E) (SG) [G254EOH]
14-R	SE-432579N	MASK CASSETTE V-G440(E2) (SG) [G440EA/EDG]
14-S	SE-432580N	MASK CASSETTE V-G445(E) (SG) [G445EA]
14-T	SE-432581N	MASK CASSETTE V-G445(E2) (SG) [G445EDG]
14-U	SE-432582N	MASK CASSETTE V-G445(E3) (SG) [G445EK]
14-V	SE-432583N	MASK CASSETTE V-G445(E4) (SG) [G445EO/EOH]
14-W	SE-432585N	MASK CASSETTE V-G455(E) (SG) [G455EOH[E]]
14-X	SE-432586N	MASK CASSETTE V-G455(E2) (SG) [G455EOH[Y1]]
14-Y	SE-432590N	MASK CASSETTE V-G457(G) (SG) [G457EOG]
15-A	BD-432269N	PANEL F(A)G240EA PART (SG)
15-B	BD-432271N	PANEL F(A)G240EDG PART (SG)
15-C	BD-433856N	PANEL F(A)G240EK PART (SG)
15-D	BD-432564N	PANEL F(A)G240EM(E/Y7)PART(SG)
15-E	BD-432272N	PANEL F(A)G240EOH(E/Y1)PART(SG
15-F	BD-432273N	PANEL F(A)G241EOH(Y1) PART(SG)
15-G	BD-432274N	PANEL F(A)G245EA PART (SG)
15-H	BD-432275N	PANEL F(A)G245EDG PART (SG)
15-I	BD-432276N	PANEL F(A)G245EK PART (SG)
15-J	BD-432277N	PANEL F(A)G245EO/EOH PART (SG)
15-K	BD-432228N	PANEL F(C)G246EA PART (SG)
15-L	BD-432229N	PANEL F(A)G247EOG PART (SG)
15-M	BD-432230N	PANEL F(A2)G250EM-K PART (SG)
15-N	BD-432231N	PANEL F(A)G255EOH(E) PART(SG)
15-O	BD-432565N	PANEL F(A)G255EOH(Y1) PART(SG)
15-P	BD-432232N	PANEL F(A)G257EOG PART (SG)
15-Q	BD-428492N	PANEL F(A)G254EOH(Y1) PART(SG)
15-R	BD-433475N	PANEL F(A)G246EK PART (SG)
15-S	BD-432326N	PANEL F(B)G440EA PART (SG)
15-T	BD-432327N	PANEL F(B)G440EDG PART (SG)
15-U	BD-432328N	PANEL F(B)G445EA PART (SG)
15-V	BD-432329N	PANEL F(B)G445EDG PART (SG)
15-W	BD-432330N	PANEL F(B)G445EK PART (SG)
15-X	BD-432331N	PANEL F(B)G445EO/EOH(Y1)PART(S
15-Y	BD-432332N	PANEL F(B)G455EOH(E) PART(SG)
15-Z	BD-432525N	PANEL F(B)G455EOH(Y1) PART(SG)
15-XA	BD-432333N	PANEL F(B)G457EOG PART (SG)

NOTE :
Parts will not be supplied if they are not listed in the parts list, even if they appear on the assembling illustrations with reference No.

16. ACCESSORY

Ref. No.	Part No.	Description
1	EW-348414N	CORD PAL
2-A	AV-428270N	REMOCON RC-X101E [G240EDG/EOH/EM,G241EOH, G250EM-K,G440EA/EDG]
2-B	AV-428271N	REMOCON RC-X121E [G245/G445EDG/EO/EOH]
2-C	AV-428272N	REMOCON RC-X121G [G247EOG]
2-D	AV-428273N	REMOCON RC-X131E [G445EA]
2-E	AV-433957N	REMOCON RC-X151E [G240EA]
2-F	AV-433945N	REMOCON RC-X161E [G240EK]
2-G	AV-433958N	REMOCON RC-X181E [G245/G246EA]
2-H	AV-428265N	REMOCON RC-X511E [G245/G246/G445EK]
2-I	AV-428266N	REMOCON RC-X521E [G254/G255EOH]
2-J	AV-428267N	REMOCON RC-X521G [G257EOG]
2-K	AV-428268N	REMOCON RC-X524E [G455EOH]
2-L	AV-428269N	REMOCON RC-X524G [G457EOG]

INDEX

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
AV428265N	16-2-H	BL428114N1	3-26	ED422252N	6-D225	EI433099N	6-IC401-B
AV428266N	16-2-I	BM421746N1	4-6	ED422519N	6-D219	EI433100N	6-IC401-C
AV428267N	16-2-J	BM428250N2	4-11	ED425278N	6-D215-A	EI433103N	6-IC401-A
AV428268N	16-2-K	BM433066N1	2-9	ED425369J	6-D208	EJ416590N	6-P201
AV428269N	16-2-L	BT432834N	6-T201-B	ED427218N	6-D404	EJ422061N	9-P851-A
AV428270N	16-2-A	BT433085N	6-T201-A	ED427506N	6-D205	EJ422094N	9-P853
AV428271N	16-2-B	BVV1123D420A	2-2-A	ED428366N	6-D210	EJ422094N	9-P854
AV428272N	16-2-C	BVV1182D410C	2-3-B	ED428367N	6-D212	EJ422169J	4-5
AV428273N	16-2-D	BVV1182D420A	2-2-B	ED428383N	6-D411	EJ422176N	6-P402
AV433945N	16-2-F	BVV1182D420C	2-2-C	ED428384N	6-D4	EJ422178N	6-P401
AV433957N	16-2-E	BVV1205D410A	2-3-A	ED428420J	6-D209-A	EJ427523N	11-P902
AV433958N	16-2-G	BVV1205D420A	2-2-D	ED428420J	6-D214-A	EJ427524N	11-P901
BAF5001V030A	5-2-B	BV387610N	6-MD1-A	EE405638N	6-TU1-E	EJ428388N	9-P852
BAF5001V030B	5-2-F	BV387611N	6-MD1-E	EE419189N	6-TU1-A	EJ429905N	11-P903
BAF5001V040A	5-2-A	BV424914N03	3-2	EE428206N	6-TU1-F	EJ429906N	6-P101
BAF5001V040B	5-2-E	BV424915N04	3-1	EE428336N	6-TU1-C	EJ429978N	6-PJ102
BAF5001V040C	5-2-D	BV424919N09	3-49	EE432823N	6-TU1-B	EJ432818N	9-P851-B
BAF5001V040D	5-2-G	BV425222N	6-MD1-B	EE432827N	6-TU1-D	EJ432820N	6-P601-B
BAF5001V040F	5-2-C	BV427963N	6-MD1-F	EF394702N	6-F201	EJ432822N	6-P601-A
BAV1222V600B	5-1-A	BV429837N	6-MD1-D	EH368948N	7-FL3	EJ432949N	6-PJ101
BAV1222V600C	5-1-B	BV429839N	6-MD1-C	EH368948N	8-FL3-A	EJ433131N	14-J301
BAV1222V600D	5-1-H	EC416655N	6-C436	EH373916N	8-FL1-A	EJ433131N	14-J302
BAV1222V600E	5-1-I	EC418706N	6-C204	EH373917N	8-FL1-B	EM428381N	6-FL401
BAV1222V600F	5-1-N	EC418706N	6-C205	EH376120N	8-FL1-D	EO345881N	6-L101
BAV1222V600G	5-1-C	EC418706N	6-C206	EH405642N	8-FL3-B	EO345881N	6-L602
BAV1222V600H	5-1-F	EC418706N	6-C207	EH414623N	7-FL2-A	EO345881N	6-L675
BAV1222V600J	5-1-E	EC418706N	6-C208	EH416618N	7-FL2-B	EO345881N	6-L696
BAV1222V600K	5-1-L	EC418706N	6-C209	EH416618N	8-FL3-C	EO345881N	6-L698
BAV1222V600L	5-1-J	EC418759N	6-C212	EH428045N	7-FL4	EO345881N	9-L851
BAV1224V600C	5-1-G	EC422101N	6-C201	EH432627N	7-FL1	EO345881N	11-L901
BAV1224V600D	5-1-K	EC422101N	6-C202	EH432629N	8-FL1-C	EO345881N	11-L902
BAV1224V600F	5-1-D	EC422104N	6-C210-B	EH433121N	7-FL52-A	EO345881N	11-L903
BAV1224V600H	5-1-M	EC422106N	6-C220	EH433121N	7-FL54	EO379354N	6-L2-A
BAV1226V600B	5-1-O	EC422107N	6-C222	EH433121N	8-FL2-A	EO390849N	6-L1
BAV1226V600C	5-1-P	EC422421N	6-C213	EH433122N	7-FL52-B	EO403270N	6-L352-A
BAV1226V600D	5-1-R	EC428385N	6-C211	EH433122N	7-FL53	EO403270N	12-L101
BAV1226V600E	5-1-S	EC431086N	6-C236	EH433122N	8-FL2-B	EO403270N	12-L102
BAV1226V600F	5-1-T	EC432918N	6-C210-A	EH433123N	7-FL51	EO403273N	8-L8
BAV1227V600C	5-1-Q	ED307573N	6-D3	EI353750N	6-IC402	EO403936N	7-L1-B
BAV1227V600E	5-1-V	ED307573N	6-D207	EI368809N	7-IC1	EO403936N	8-L1-B
BAV1227V600H	5-1-U	ED307573N	6-D218	EI368809N	8-IC1	EO408834N	7-L52
BB428300N	3-55	ED307573N	6-D231	EI368829N	7-X1	EO408956N	7-L6-B
BD428492N	15-15-Q	ED307573N	6-D232	EI389471N	6-IC1	EO408957N	8-L7-A
BD432228N	15-15-K	ED307573N	6-D301	EI390053N	6-IC2	EO410255N	7-L6-A
BD432229N	15-15-L	ED307573N	6-D405	EI403233N	6-IC403	EO410256N	8-L7-C
BD432230N	15-15-M	ED307573N	6-D406	EI405660N	6-X601-A	EO414830N	6-L402
BD432231N	15-15-N	ED307573N	6-D410	EI405660N	6-X602	EO416716N	7-L5-A
BD432232N	15-15-P	ED307573N	6-D412	EI419278N	6-IC301	EO416716N	7-L51
BD432269N	15-15-A	ED307573N	6-D413	EI422128N	6-IC201	EO419251N	8-L7-B
BD432271N	15-15-B	ED307573N	6-D601	EI422145N	6-IC405	EO422134N	6-L203
BD432272N	15-15-E	ED307573N	6-D602	EI422442N	6-IC404-A	EO422134N	6-L205
BD432273N	15-15-F	ED307573N	6-D603	EI425188N	11-IC902	EO422473N	6-L603
BD432274N	15-15-G	ED307573N	9-D851	EI425240N	6-X401	EO422473N	6-L671
BD432275N	15-15-H	ED307573N	11-D901	EI428401N	6-IC406	EO422474N	6-L697
BD432276N	15-15-I	ED307573N	14-D301	EI428403N	6-IC407	EO422476N	6-L674
BD432277N	15-15-J	ED390012N	6-D402	EI428406N	6-IC751	EO422477N	6-L606
BD432326N	15-15-S	ED390012N	6-D403	EI429904N	11-IC901	EO422477N	6-L652
BD432327N	15-15-T	ED394991N	6-D215-B	EI430862N	12-IC101	EO422478N	6-L610
BD432328N	15-15-U	ED401046J	6-D209-B	EI430864N	12-IC102	EO422478N	6-L651
BD432329N	15-15-V	ED401046J	6-D214-B	EI430866N	12-X101	EO422479N	6-L601
BD432330N	15-15-W	ED403280N	6-D220	EI431006N	6-X601-B	EO422479N	6-L605
BD432331N	15-15-X	ED403280N	6-D221	EI431275N	6-IC404-B	EO422488N	6-L3
BD432332N	15-15-Y	ED404220N	12-D101	EI431323N	6-X402	EO422488N	6-L653
BD432333N	15-15-XA	ED404242N	6-D229	EI432778N	9-IC851-A	EO424201N	6-L2-C
BD432525N	15-15-Z	ED404242N	6-D230	EI432779N	9-IC851-B	EO425199N	6-L2-B
BD432564N	15-15-D	ED418622N	6-D201	EI432780N	6-IC697	EO425203N	6-L676
BD432565N	15-15-O	ED418622N	6-D202	EI432781N	6-IC601-A	EO425203N	6-L677
BD433475N	15-15-R	ED418622N	6-D203	EI432783N	6-IC101	EO426410N	6-L352-B
BD433856N	15-15-C	ED418622N	6-D204	EI432784N	6-IC601-B	EO427373N	7-L1-A
BL424913N06	3-53	ED422251N	6-D401	EI433089N	6-IC696	EO427540N	6-FL330

Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.
EO428123N	7-L5-B	ET392663N	6-TR603	MI420037N	4-25	SZ426915N	6-1
EO428349N	6-L201	ET392663N	6-TR606	MI420038N4	4-27	SZ428508N	6-2
EO428358N	6-L654	ET392663N	6-TR607	ML420006N2	3-22	SZ429350N	6-3
EO428358N	6-L672	ET392663N	6-TR610	ML420068N1	3-43	SZ429351N	6-4
EO428360N	6-L673	ET392663N	6-TR611	ML420086N1	3-16	VT387394N3	3-3
EO428417N	6-L202	ET392663N	6-TR613	ML420089N1	3-15	VT418700J1	2-5
EO428463N	8-L1-A	ET392663N	6-TR652	ML420092N1	3-8	ZG420015N1	3-24
EO432600N	8-VL5-A	ET392663N	6-TR654	ML420097N3	3-12	ZG420034N2	4-35
EO432601N	7-VL4	ET392663N	6-TR657	ML420099N2	4-20	ZG420036N	4-24
EO432601N	8-VL5-B	ET392663N	6-TR672	ML420100N3	4-32	ZG420071N1	3-44
EO432605N	8-VL4-A	ET392663N	6-TR673	ML420102N1	3-9	ZG420075N	3-38
EO432607N	7-VL3	ET392663N	6-TR674	ML420110N4	4-18	ZG420091N	3-17
EO432607N	8-VL4-B	ET392663N	11-TR903	ML420133N2	4-31	ZG420095N	3-7
EO432610N	8-VL3-A	ET392663N	12-TR104	ML420168N1	3-33	ZG420098N	3-11
EO432611N	7-VL2	ET392663N	14-TR301	ML420170N	3-47	ZG420101N	4-33
EO432611N	8-VL3-B	ET392663N	14-TR302	ML420416N3	3-25	ZG420103N1	3-10
EO432680N	8-L1-C	ET392746N1	6-TR1	ML426550N	4-34	ZG420105N	4-7
EO432682N	6-L401	ET392746N1	6-TR3	ML428102N1	3-28	ZG420117N	4-16
ER397385N	6-FR201	ET392746N1	6-TR9	ML428108N	4-12	ZG420134N1	4-30
ER400729N	6-FR203	ET392746N1	6-TR11	MR420022N	3-21	ZG420166N	3-52
ER400729N	6-FR401	ET392746N1	6-TR14	MR420106N	4-8	ZG420167N1	3-50
ER408829N	6-FR206	ET392746N1	6-TR101	MR420109N	4-9	ZG420169N1	3-34
ER416671N	6-R210-B	ET392746N1	6-TR406	MT424632N2	3-13	ZG425178N	3-51-B
ER418648N	6-FR202	ET392746N1	6-TR602	MZ420016N2	3-23	ZG426481N	3-51-A
ER422189N	6-R201	ET392746N1	11-TR904	MZ420035N	4-23	ZG428105N1	3-27
ER422512N	6-R208	ET392746N1	13-TR202	MZ420064N1	3-29	ZG428110N	4-13
ER428204N	6-FR204	ET414816N	6-TR4	MZ420067N	3-31	ZG429541N	15-13
ER428386N	6-R210-A	ET415140N	6-TR204	MZ420122N1	4-17	ZS321298N	2-1
ER428396N	6-R206	ET416697N	6-TR211	MZ420123N	4-21	ZS323728N	15-7
ES414593N	6-SW403	ET416932N	7-TR2	MZ420124N3	4-19	ZS336714N	2-6
ES414593N	6-SW404	ET416932N	7-TR4	MZ420132N3	3-32	ZS358936N	2-4
ES414593N	6-SW405	ET416932N	8-TR2	MZ420172N2	3-46	ZS358936N	3-45
ES414593N	6-SW406	ET416933N	7-TR3	MZ424916N04	4-15	ZS358936N	4-2
ES414593N	6-SW407	ET416933N	7-TR51	MZ424917N03	4-14	ZS362533	3-40
ES414593N	6-SW408	ET416933N	7-TR52	MZ428101N	3-6	ZS376521N	15-10
ES414593N	6-SW409	ET419014N	6-TR301	MZ428103N	3-30	ZS379350N	2-11
ES419326N1	4-1	ET419014N	12-TR101	SA422907N	15-12	ZS383761J	3-5
ES426275N	6-SW401	ET422113N	6-PH201	SE432523N	15-14-A	ZS389950N	4-3
ES428362N	6-SW402	ET422129N	6-TR202-A	SE432535N	15-14-P	ZS393515N	15-2
ET354365	12-TR102	ET427538N	6-TR201-B	SE432536N	15-14-L	ZS403887N	3-18
ET361901N	13-TR201	ET428248N	6-TR7	SE432542N	15-14-O	ZS418480J	3-39
ET361961N	6-TR405	ET428371N	6-TR201-A	SE432543N	15-14-N	ZS418616J	3-4
ET361961N	6-TR604	ET428373N	6-TR207	SE432544N	15-14-Q	ZS422170J	3-37
ET361961N	6-TR614	ET428400N	6-TR409	SE432545N	15-14-I	ZS425981	4-4
ET361961N	9-TR853	ET428407N	6-TR202-B	SE432546N	15-14-H	ZS426412N	15-3
ET361961N	11-TR901	ET428407N	6-TR217	SE432547N	15-14-G	ZS426416N	15-6
ET364023N	6-TR8	ET429897N	6-TR12	SE432548N	15-14-F	ZS432843N	4-29
ET364082N	12-TR103	ET429899N	6-TR303	SE432549N	15-14-E	ZS467796N	2-10
ET364291N	6-TR13	ET430868N	6-TR199	SE432550N	15-14-C	ZS563444N	2-8
ET364291N	6-TR608	ET432740N	7-TR1	SE432551N	15-14-B	ZS575392	3-36
ET364291N	6-TR653	ET432740N	8-TR1	SE432579N	15-14-R	ZW321317	4-36
ET364291N	11-TR902	ET432910N	10-PH401	SE432580N	15-14-S	ZW324417	3-42
ET364492N	6-TR2	ET433071N	6-TR304	SE432581N	15-14-T	ZW350839	3-41
ET366753N	6-TR601	EV389476N	8-VR51	SE432582N	15-14-U	ZW389923J	4-28
ET366753N	6-TR612	EV432752N	7-VR1	SE432583N	15-14-V	ZW395919J	3-20
ET368786N	6-TR214	EV433090N	13-VR201	SE432585N	15-14-W	ZW418816J	4-26
ET373201N	6-TR5	EV433090N	13-VR202	SE432586N	15-14-X	ZW424667N	3-14
ET373201N	6-TR302	EV433092N	13-VR203	SE432590N	15-14-Y		
ET386784N	6-TR203	EW348414N	16-1	SE433474N	15-14-M		
ET390009N	6-TR401	EW422530J	15-9-B	SE433476N	15-14-K		
ET390009N	6-TR402	EW425599N	15-11-A	SE433818N	15-14-J		
ET390010N	6-TR403	EW430842N	15-11-B	SE433857N	15-14-D		
ET390010N	6-TR404	EW432812N	15-9-A	SP429099N	15-8-B		
ET392663N	6-TR6	HE422168N	3-19	SP429100N	15-8-C		
ET392663N	6-TR10	HR416732N	3-35	SP432477N	15-8-A		
ET392663N	6-TR205	HZ417681N	15-5	SP432478N	15-8-D		
ET392663N	6-TR208	HZ428509N	15-4	SP432485N	15-8-G		
ET392663N	6-TR212	MA429081N1	2-7	SP432487N	15-8-F		
ET392663N	6-TR213	MB420053N	4-10	SP432488N	15-8-E		
ET392663N	6-TR351	MI420023N3	3-48	SP433447N	15-1		

ABBREVIATIONS (VIDEO)

ABBREVIATION	EXPLANATION	ABBREVIATION	EXPLANATION
A	Audio or Analogue	MOD	MODulator
AC	Alternating Current	MRS	Motor ReverSe
ACC	Automatic Color Control	NAP	NtscAmusement Pal
A/C	Audio and Control	NG	Noise Gate
ADJ	ADJust (ment)	NICAM	Near Instanteneous CompandAudio Multiplex
AFC	Automatic Frequency Control		
AFT	Automatic Fine Tuning	NON-LIN	NON-LINear
AGC	Automatic Gain Control	N.T.S.C.	National Television System Committee
AH	Audio Head	OSC	OSCillator
AL	ALways (voltage)	PAL	Phase Alternation by Line
ALC	Automatic Level Control	PB	Play Back
A-SW.P	Audio SWitching Pulse	PCB (P.C.B)	Printed Circuit Board
A-MUTE	Audio MUTE	P-COM	Phase-COMparator
ANT	ANTenna	P DOWN	Power DOWN
APC	Automatic Phase Control	PG	Pulse Generator
ASSY	ASSemblY	P.I.P	Picture In Picture
BAL	BALance	PL, PLG	PLunger (PLunGer)
B DOWN	Break DOWN	PRG (PGM)	PRoGram (ProGraM)
BGP	Burst Gate Pulse	PU	Pick UP (head, pulse)
BLK	BLocK or BLacK	PWR	PoWeR
BOP	Blank Output Pulse	Q	Quality factor
BPF	Band Pass Filter	R	Right
BU	Back Up (voltage)	RAM	Random Access Memory
B/W	Black and White	REC	RECord
C	Chroma or Color	REF	REFerence
CCD	Charge Coupled Device	REF-V	REFerence Vertical signal
CCIR	Comit Consultatif International des Radio communications	REG	REGulator
		REV (REVW)	REView (REVieW)
CH (ch)	CHannel (channel)	REW	REWind
CLK	CLocK	RF	Radio Frequency
CM	Capstan Motor	ROM	Read Only Memory
CN	CoNnector	R.S SW	Record-Safety SWitch
COMP	COMParator	RST (RES)	ReSet (RESet)
CSW	Cassette SWitch	RVS	ReVerSe
CSYNC	Composite SYNC	S	Sensor, Shield
CTL	ConTrol	SAW	Surface Acoustic Wave
CUE	CUE	SC	SimulCast
DAC	Digital to Analog Converter	S CLK	Serial CLocK
DC	Direct Current	SECAM	SÉquentiel Couleur À Mémoire
DEMOD	DEMODulator	S & H	Sample and Hold
DET	DETetct (DETector)	SLP	Super Long Play
DL	Delay Line	SP	Standard Play
DM	Drum Motor	SPD	SPeeD
DOC	Drop Out Compensator	SRP	Supply Reel Pulse
D.P.E	Drum Phase Error	SRV	SeRVo
D.PG	Drum Pulse Generator	SOW	Sync On Word
EE	Electronic to Electronic	STBY	STandBY
EF	Emitter Follower	S.VHS	Super VHS
EMPHA	EMPHAsis	SW	SWitch
ENV	ENVelope	SW'NG	SWitchiNG
EP	Extended Play	SWP	SWitching Pulse
EP ROM	Erasable Programmable ROM	SYNC	SYNChronize
EQ	EQualizer	T-AUDIO	Tuner AUDIO
FE	Full track Erase	TPZ (TRAPE)	TraPeZoid (TRAPEzoid)
FF	Flip-Flop or Fast Foward	TRK	TRacKing
FG	Frequency Generator	TRP	Take up Reel Pulse
Fig	Figure	T/U	Take Up
FLD	FLuorescent Display	TV	TeleVision
FM	Frequency Modulation	UHF	Ultra High Frequency
Fo	resonance Frequency	UNR	UNRegulated (voltage)
FREQ	FREQuency	V	Vertical or Video
GND	GrouND	VASS	Video Address Search System
H	Horizontal	VCO	Voltage Controlled Oscillator
HP	Horizontal (sync) pulse	VH	Video Head
HPF	High Pass Filter	VHF	Very High Frequency
HQ	High Quality System	VHS	Video Home System
IC	Integrated Circuit	VIF	Video Intermediate Frequency
ID	IDentification	VISS	Video Index Search System
IDL	IDLe (Voltage)	VJ	Video Judge
IMS	Interactive Monitor System	VM	Voltage for Memory
INS	INSert	VOB	Video On Blank
INV	INVerter	VOW	Video On Word
L	Left	VP	Vertical (sync) Pulse
LED	Light Emitting Diode	VPS	Video Program System
LIM	LIMitter	VPT	Video Programming by video Text
LM	Loading Motor	VT	Voltage' for Tuning
LM STP	Loading Motor STop	WHT	WHiTe
LP	Long Play	Y	Luminance
LPF	Low Pass Filter	2H	2 Hour (SP)
ME-SECAM	Middle East SECAM	4H	4 Hour (LP)
MI-COM	MIcro COMputer	6H	6 Hour (SLP/EP)
MM	Mono-stayble Multi		

AKAI ELECTRIC CO., LTD.

12-14, 2-Chome, Higashi-Kojiya, Ohta-ku, Tokyo, Japan
Video Marketing Department TEL:Tokyo (3745) 9884
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MODEL VS-G240, G241, G245, G246, G247
MODEL VS-G250, G254, G255, G257
MODEL VS-G440, G445, G455, G457

SCHEMATIC DIAGRAMS AND PC BOARDS

TABLE OF CONTENTS

I. BLOCK DIAGRAMS
1. VIDEO 3
2. SERVO 4
3. OPERATION & SYSCON 5
4. AUDIO 6

II. SCHEMATIC DIAGRAMS AND PC BOARDS
1. CONNECTION DIAGRAM 7
2. MAIN 1/4 (POWER BLK) 8
3. MAIN 2/4 (RF, AUDIO BLK) 9
4. MAIN 3/4 (SERVO/SYSCON, OPERATION & VPS BLK) 10
5. MAIN 4/4 (VIDEO BLK) 11
6. CANAL PLUS 14
7. PRE AMP (2 HEAD) 17
8. PRE AMP (4 HEAD) 18
9. VIF-NORMAL 21
10. VIF-EDG 22
11. KARAOKE 25

III. INFORMATION OF ICs & FLD 26

Use these schematic diagrams and PC boards together with the provided service manual.

PRINCIPAL DIFFERENCES BETWEEN THE MODELS

MODEL No.	VIDEO HEAD	2 SPEED	* WITH DECODER	VPS	PDC	* E²C ROM	
						2 kB	4 kB
VS-G240EA	2 HEAD	–	–	–	–	O	–
VS-G240EDG	2 HEAD	–	–	–	–	O	–
VS-G240EK	2 HEAD	O	–	–	O	–	O
VS-G240EM	2 HEAD	O	–	–	–	O	–
VS-G240EOH(E)	2 HEAD	–	O	–	–	O	–
VS-G240EOH(Y1)	2 HEAD	–	–	–	–	O	–
VS-G241EOH(Y1)	2 HEAD	–	–	–	–	O	–
VS-G245EA	2 HEAD	–	–	–	–	–	O
VS-G245EDG	2 HEAD	–	O	O	–	–	O
VS-G245EK	2 HEAD	O	–	–	O	O	–
VS-G245EO	2 HEAD	–	–	–	–	–	O
VS-G245EOH(Y1)	2 HEAD	–	–	–	–	–	O
VS-G246EA	2 HEAD	–	–	–	–	–	O
VS-G246EK	2 HEAD	O	–	–	O	O	–
VS-G247EOG	2 HEAD	–	O	O	–	–	O
VS-G250EM-K	2 HEAD	O	–	–	–	O	–
VS-G254EOH(Y1)	2 HEAD	–	O	–	O	O	–
VS-G255EOH(E)	2 HEAD	–	O	–	O	O	–
VS-G255EOH(Y1)	2 HEAD	–	O	–	O	O	–
VS-G257EOG	2 HEAD	–	O	O	–	O	–
VS-G440EA	4 HEAD	O	–	–	–	O	–
VS-G440EDG	4 HEAD	O	–	–	–	O	–
VS-G445EA	4 HEAD	O	–	–	–	–	O
VS-G445EDG	4 HEAD	O	O	O	–	–	O
VS-G445EK	4 HEAD	O	–	–	O	O	–
VS-G445EO	4 HEAD	O	–	–	–	–	O
VS-G445EOH(Y1)	4 HEAD	O	–	–	–	–	O
VS-G455EOH(E)	4 HEAD	O	O	–	O	O	–
VS-G455EOH(Y1)	4 HEAD	O	O	–	O	O	–
VS-G457EOG	4 HEAD	O	O	O	–	O	–

*** NOTE:**

1. Models with the CANAL PLUS PCB (DECODER) are shown as "WITH DEC" in the schematic diagrams and block diagrams. Models without the CANAL PLUS PCB are shown as "WITHOUT DEC".

2. IC404 (EEP-ROM) used on the MAIN PCB is designated as follows.
   - G-CODE, SHOWVIEW or VIDEO-PLUS models without LCD remote control: 4 kB ROM.
   - Excepting above models: 2 kB ROM.

3. When you look at the schematic diagrams or block diagrams in this manual, please refer to the above information for pertinent parts information.